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October 24, 2019

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Mr. Patrick Wruck, Commission Secretary and Manager, Regulatory Support

Dear Mr. Wruck:

Re: FortisBC Energy Inc. (FEI)

Project No. 1599033

Revelstoke Propane Portfolio Cost Amalgamation Application (Application)

Response to the British Columbia Utilities Commission (BCUC) Information Request (IR) No. 1

On July 18, 2019, FEI filed the Application referenced above. In accordance with BCUC Order G-201-19 setting out the Regulatory Timetable for the review of the Application, FEI respectfully submits the attached response to BCUC IR No. 1.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC ENERGY INC.

Original signed:

Doug Slater

Attachments

cc (email only): Registered Parties

Table of Contents **Page no.**

A. AMALGAMATION OPTIONS AND OBJECTIVES

1.0 Reference: AMALGAMATION OPTIONS AND OBJECTIVES
Exhibit B-1, Application, Section 1.1, p. 1
Revelstoke Propane Supply

On Page 1 of the Application, FEI states:

> When the piped propane system was first introduced to Revelstoke in 1991, it was because Revelstoke was located at too great a distance from the natural gas distribution system and its forecast load was insufficient to make connection economic. Although FEI's customers in Revelstoke are charged the same delivery rate as those in other regions across BC (except Fort Nelson), they are charged a different cost for energy relative to FEI's natural gas customers. Commodity prices for propane have historically been more volatile and higher than natural gas prices on an energy equivalent basis. As a result, Revelstoke propane customers have had less predictable and higher energy costs relative to FEI's natural gas customers.

1.1 Please confirm, or explain otherwise, that since 1991, Revelstoke customers have had continually higher energy costs compared to FEI's natural gas customers.

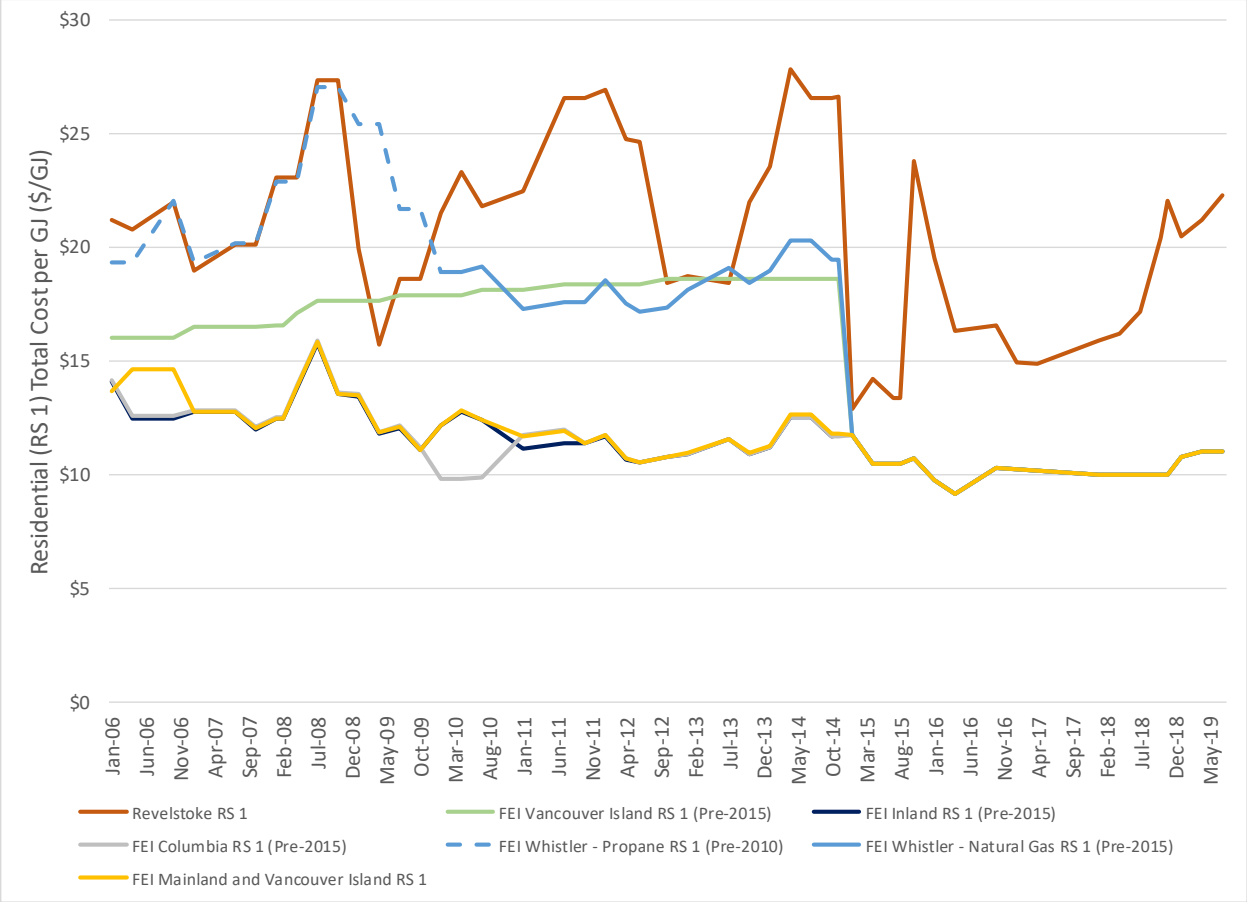
Response:

Historical data back to 1991 is not readily available; however, FEI is able to provide historical data to 2006 based on information from the Application. FEI believes this provides a reasonable range of information to support the relationship between propane and natural gas costs.

Please refer to Attachment 1.1 which provides the effective rate history per GJ for FEI's Revelstoke propane customers and FEI's natural gas customers in Rate Schedules (RS) 1, 2, and 3 from 2006 to present.

As shown in Figures 1 through 3 below, the historical rate data included as part of this information request illustrates that Revelstoke customers (shown as the RED line in all three figures below) have experienced predominantly higher volatility and a higher cost of energy than FEI's natural gas customers as discussed in the preamble above. FEI notes that the effective rates provided prior to January 2015 are pre-postage stamp delivery rates and, therefore, are listed separately as Lower Mainland, Inland, Columbia, Vancouver Island, and Whistler. FEI also notes that Whistler was a propane system prior to 2009 while from 2009 to 2010 was the transition year from propane to natural gas (shown as dashed-blue line in the Figure below).

1 **Figure 1: Residential RS 1 Customers' Total Cost per GJ ($/GJ)**



2

Figure 2: Small Commercial RS 2 Customers' Total Cost per GJ ($/GJ)

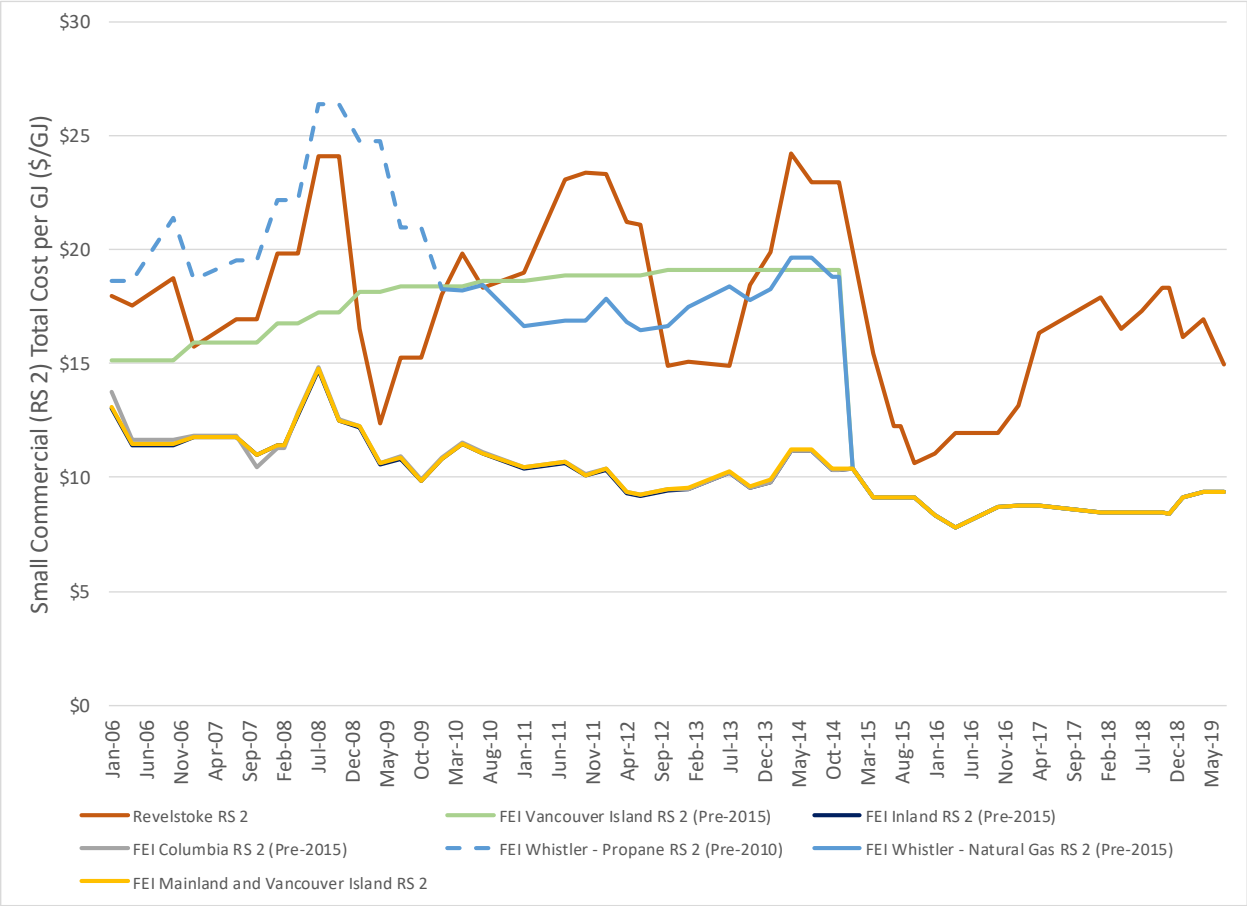
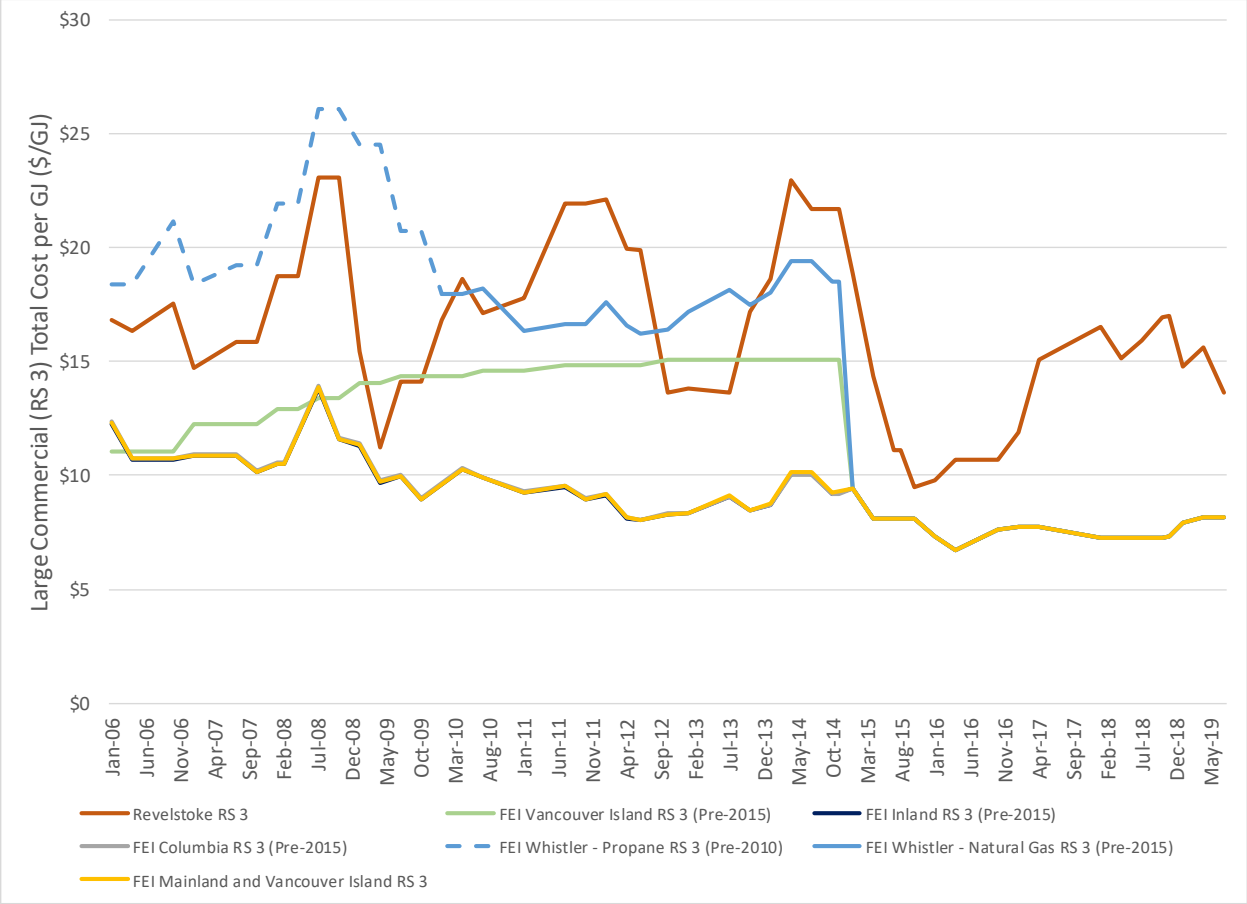


Figure 3: Large Commercial RS 3 Customers' Total Cost per GJ ($/GJ)



1.1.1 If confirmed, please explain FEI's rationale for proposing the Revelstoke propane amalgamation at this time.

Response:

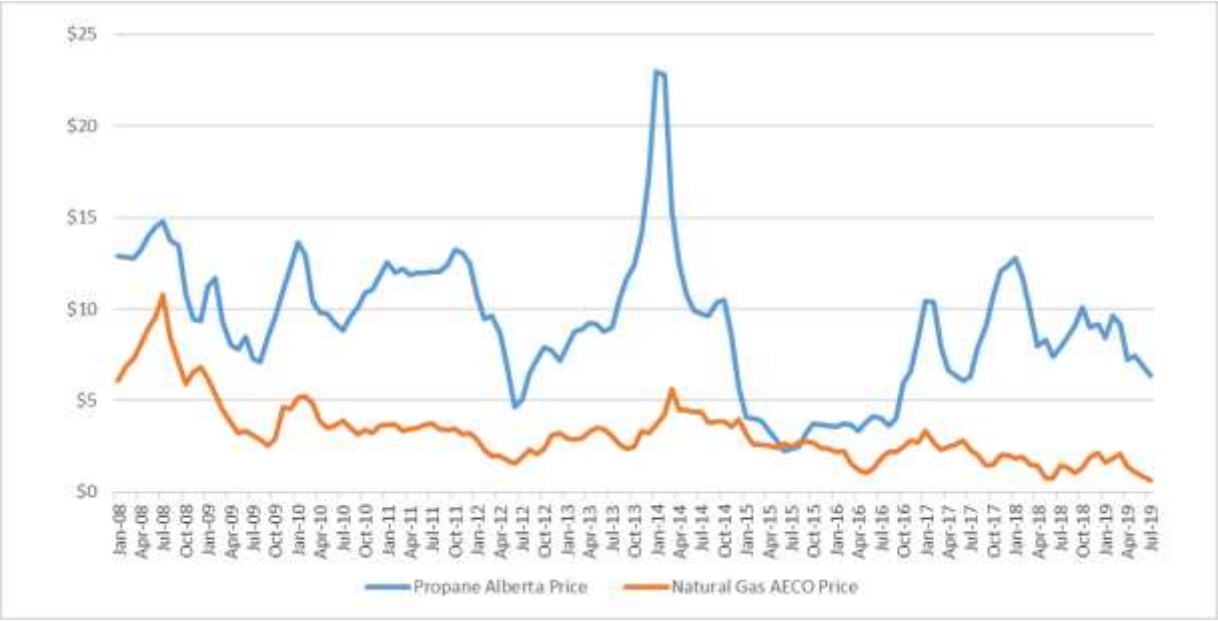
FEI's proposal to amalgamate the Revelstoke propane portfolio costs with the FEI natural gas portfolio costs will provide Revelstoke customers with rate stability and lower energy costs that match that of FEI's natural gas customers. In support of BC's energy objectives under Section 2(h) and 2(k) of the *Clean Energy Act,* the Revelstoke annual energy bill reductions proposed may contribute to encouraging other Revelstoke energy users to switch from higher-carbon heating oil to propane, economic development, creation and retention of jobs.

As discussed in the responses to BCUC IRs 1.8.3. 1.9.2, 1.9.2.1, and 1.9.3, during 2015 to 2016, FEI investigated the potential of connecting Revelstoke with FEI's natural gas system via a physical or a virtual pipeline; however, these options were deemed not economically or technically feasible at that time. FEI has since investigated other mechanisms and is now able to bring forward an Application that represents an innovative, least cost, non-capital solution to connect Revelstoke to the natural gas system while minimizing the impact to FEI's natural gas customers and further aligning with postage stamp ratemaking principles.

1.2 Please provide a chart comparing propane and natural gas prices since 1991.

Response:

Historical data back to 1991 is not readily available. The chart below represents an updated version of Figure 2-1 from the Application that now contains data until July 2019 rather than ending in January 2019. The chart shows the comparison of propane to natural gas prices from January 2008 to July 2019.



1.3 Has the price of propane relative to natural gas (i.e. the average price differential) increased since 1991? Please explain, providing any relevant calculations in your response.

Response:

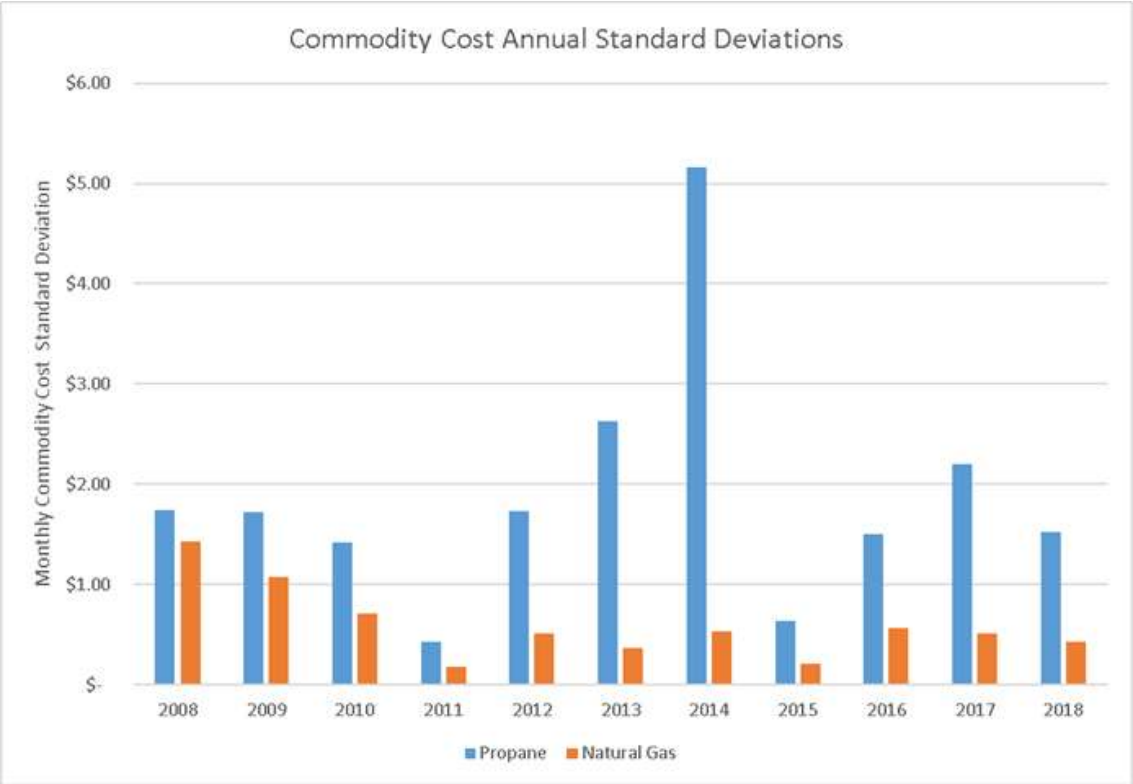
Historical data back to 1991 is not readily available. The table below shows that the annual propane to natural gas average price differential fluctuates from year to year for the period 2008 to 2018. The five-year rolling average of the price differential ratio, as shown in Figure 3-1 in the Application, remains relatively flat.

Average ($/GJ)	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Propane Alberta Price	$ 12.651	$ 9.358	$ 10.671	$ 12.311	$ 7.623	$ 10.657	$ 12.390	$ 3.292	$ 4.567	$ 8.875	$ 9.315
Natural Gas AECO Price	$ 7.704	$ 3.922	$ 3.913	$ 3.484	$ 2.277	$ 2.996	$ 4.186	$ 2.622	$ 1.984	$ 2.301	$ 1.452
Price Differential	$ 4.947	$ 5.436	$ 6.758	$ 8.828	$ 5.346	$ 7.661	$ 8.204	$ 0.670	$ 2.583	$ 6.575	$ 7.863
Price Differential Ratio	1.642	2.386	2.727	3.534	3.347	3.557	2.960	1.255	2.302	3.857	6.415
5-Year Rolling Price Differential Ratio					2.470	3.051	3.183	2.973	2.739	2.824	3.064

1.4 Has the volatility of propane relative to natural gas increased since 1991? Please explain, providing any relevant calculations in your response.

Response:

The chart below shows the annual standard deviations comparison for propane Alberta price and natural gas AECO price from 2008 to 2018 (data back to 1991 is not readily available). Propane price volatility peaked in 2013 and 2014 and remained significantly higher than natural gas price volatility. For the recent period from 2016 to 2018 the monthly propane price volatility was greater than $1.50/GJ while natural gas price volatility was approximately $0.50/GJ.


Commodity Cost Annual Standard Deviations
Monthly Commodity Cost Standard Deviation
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
$-
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Propane
Natural Gas

1

2

2.0 Reference: AMALGAMATION OPTIONS AND OBJECTIVES

Exhibit B-1, Section 1.1, p. 1; Section 2.2, pp. 5–6; Section 3.2, pp. 8–11, Section 3.3, pp. 12–13; Section 3.4, p. 14,

Proposed Changes to Commodity Rate Setting & Objectives

On page 1 of the Application, FEI states: "The proposed rate setting mechanism will provide Revelstoke customers with propane rate stability that matches the stability of FEI's natural gas customer rates, and can provide propane commodity rate relief to Revelstoke customers." [Emphasis Added]

On pages 5–6 of the Application, FEI states:

> This Application proposes changes to reduce future commodity rate volatility for FEI's Revelstoke propane customers. The proposed mechanism will provide Revelstoke propane customers with propane rate stability matching that of FEI natural gas customer rates and, based on the historical relationship between the natural gas and propane commodities, could also reduce annual energy bills for Revelstoke propane customers. Volatile energy input costs in a specific region can be a disadvantage to households and businesses that can lead to diminished economic development and job creation opportunities. FEI believes that stabilizing propane rates is beneficial for Revelstoke customers and may contribute to encouraging other Revelstoke energy users to switch from higher-carbon heating oil to propane. As such, the proposed changes support the following two of BC's energy objectives under section 2 of the *Clean Energy Act*:
>
> (h) to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia; and
>
> (k) to encourage economic development and the creation and retention of jobs. [Emphasis added]

On page 8 of the Application, FEI states: "FEI considered two options for calculating the propane gas cost recovery rates for Revelstoke customers: 1) equal gas cost recovery and 2) a five-year rolling average of the price difference between propane and natural gas."

On page 9 of the Application, FEI states:

> Option 1 treats Revelstoke propane customers and FEI's natural gas customers the same with respect to the commodity related charges…Under this equal commodity cost recovery option, FEI's Revelstoke propane and FEI's natural gas customers will pay the same commodity related charges per GJ, but alignment with BC's energy objectives is preserved as propane customers will continue to pay higher carbon tax rates than natural gas customers.

On pages 10–11 of the Application, FEI states:

> Under Option 2, FEI proposes to set the propane gas cost recovery rate with a premium multiplier based on the five-year rolling average of annual propane to natural gas price ratios…. FEI notes that this rate setting mechanism does not provide rate relief to Revelstoke customers as, over the long term, the negative and positive variances between the current price difference of propane versus natural gas and the price difference set by the five-year rolling average indexed multiplier will tend to counterbalance each other. [Emphasis Added]

On page 14, FEI provides a comparison table:

Table 3-5: Comparison of Propane Gas Cost Recovery Rates Calculation Options

	Option 1 – Equal Natural Gas and Propane Cost Recovery	Option 2 – Five-Year Rolling Price Difference
Mitigates Propane Rate Volatility	Yes	Yes
Provides Rate Relief for Revelstoke Propane Customers	Yes	No
Midstream Rate Impact for FEI Natural Gas Customers	Small	Small
Supports BC's Energy Objectives	Yes	Yes

2.1 Please confirm, or explain otherwise, that "rate relief for Revelstoke propane customers" is an aim to achieve rate affordability for Revelstoke propane customers.

Response:

FEI submitted the Application based on its observation that FEI's Revelstoke propane customers have historically experienced greater cost of energy rate fluctuations and higher rates than FEI natural gas customers. The two equally weighted key objectives of the Application are to provide rate relief (or rate affordability) and to mitigate the propane rate volatility experienced by Revelstoke customers. In addition to these key objectives, FEI presents two other factors that were considered in Table 3-5. These factors are not objectives themselves, but assisted FEI in examining the benefits of meeting the key objectives.

Table 3-5 highlights that Option 1, unlike Option 2, meets both key objectives. Since FEI's Revelstoke customers have historically experienced higher and more volatile commodity rates than FEI's natural gas customers, Option 1 would improve rate affordability for FEI's Revelstoke propane customers. Fully amalgamating the propane and natural gas portfolio costs on an equal basis (as proposed in Option 1) ensures that FEI customers in Revelstoke do not experience differing cost of energy recovery rates for gas service due to their location within FEI's service

territory. As such, Option 1 represents an improvement to the current situation in line with the accepted principle of common rates across geographic locations within FEI's service territory.

As highlighted in Table 3-5, Option 1 provides this additional benefit over Option 2 while maintaining midstream rate impacts for FEI natural gas customers in the same order of magnitude as Option 2. As explained in the response to BCUC IR 1.8.3, Option 1 represents an innovative, non-capital solution which minimizes the rate impact to FEI's natural gas customers as compared to the other alternatives for converting Revelstoke to natural gas.

2.2 Please explain if Table 3-5 includes all of FEI's objectives of the proposed amalgamation, ranked in order of priority.

Response:

Please refer to the response to BCUC IR 1.2.1.

2.2.1 Please provide all of FEI's objective(s) of the proposed amalgamation, ranked according to FEI's priority.

Response:

Please refer to the response to BCUC IR 1.2.1.

2.2.1.1 Please explain how FEI ranked multiple objectives.

Response:

Please refer to the response to BCUC IR 1.2.1.

2.2.1.2 Please update Table 3-5, as needed, evaluating Options 1 and 2 against the listed objectives, ranked according to their priority.

Response:

Please refer to the response to BCUC IR 1.2.1.

2.3 Please confirm which proposed option is FEI's preferred option for Revelstoke customers.

Response:

FEI confirms that Option 1 FEI's proposal, as noted in lines 10-11 on page 13 of the Application. FEI's rationale for selecting Option 1 is further explained in the response to BCUC IR 1.2.1.

2.4 Please discuss the difference between option 1 and option 2 in terms of ability to provide rate stability.

Response:

Both options are designed to mitigate propane rate volatility by providing a materially identical level of rate stability with respect to the frequency of rate changes.

FEI's proposed Option 1 provides the same frequency and magnitude of rate changes for Revelstoke customers as FEI's natural gas customers on the standard commodity sales rate offerings receive. Whereas under FEI's Option 2, the frequency of rate changes for Revelstoke customers would be linked to changes in the FEI natural gas rates, but the magnitude of the propane rate changes would differ based on the five-year rolling average of the price difference between propane and natural gas.

2.5 Has FEI received any comments or concerns from the City of Revelstoke or Revelstoke customers related to energy price or stability? In your response, please provide a summary of any feedback received.

Response:

Yes, FEI has received comments from the City of Revelstoke, the businesses of Revelstoke, and the community of Revelstoke around energy price and stability. The conversations mainly occurred during FEI's exploration into the potential of converting the Revelstoke distribution system from propane to natural gas and have continued as FEI has prepared this Application. The vast majority of the businesses, the community as well as the City support lower fuel rates in Revelstoke. Specific examples include:

- In 2014, FEI held a public open house to discuss the potential to convert the system supply from propane to LNG. The majority of the comments received were around how quickly the project could be completed. These comments were not based on the physical fuel supply switch but rather on how the switch would impact rates, both in terms of price and stability.
- From 2014 onward, FEI has met numerous times with representatives from staff and council at the City of Revelstoke. The City has continually requested that FEI explore options to reduce energy costs and bring price stability to FEI rates. The City has advocated on behalf of the residents and businesses who feel that propane rates put them at disadvantage to the rest of FEI customers.
- From 2015 onward, FEI representatives have met annually with Gorman Brothers Lumber Ltd, the owners of the Downie Timber Ltd sawmill in Revelstoke. The mill representatives discussed issues on price and stability at the Downie site in relation to their other mills in West Kelowna and Canoe, BC. At each meeting, the mill has raised the issue of the difference in energy prices between propane and natural gas means it is less expensive for Gorman to truck wet lumber from Revelstoke to their other mills to dry rather than expanding their operations in Revelstoke.
- During 2015 and 2016, FEI representatives met with the General Manager of the Sutton Place and Sandman Hotels in Revelstoke, both owned by Northlands Properties Ltd. During these conversations, the Sutton Group indicated that energy costs in Revelstoke were a barrier to real estate development and also that energy costs comprised a higher percentage of strata fees in Revelstoke compared to their properties in other British Columbia locations. Subsequent discussions focussed on the importance of rate stability to attracting investors that require a 20+ year analysis.
- In 2015, FEI representatives gave a presentation to the Revelstoke Chamber of Commerce. Over twenty small businesses attended and were all in support of the lower rates the project would bring.

Concerns around the conversion project were minimal. These concerns were focussed on the impact that lower rates would have on fuel switching, both in terms of accelerating a switch from

residences with heating oil joining the FEI system as well as slowing a transition to renewable energy within Revelstoke.

2.6 Please confirm, or otherwise explain, that FEI conducted consultations with the residents of Revelstoke prior to filing the Application.

Response:

As discussed in the response to BCUC IR 1.2.5, FEI has conducted consultation with residents of Revelstoke in 2015/2016 as part of an exploratory project to convert the propane system to natural gas. From this consultation, FEI clearly heard that the vast majority of Revelstoke residents want lower energy costs and price stability.

2.6.1 If confirmed, please provide any information FEI provided to Revelstoke customers prior to filing the Application.

Response:

As discussed in the response to BCUC IR 1.2.5, FEI did not provide any information specific to this Application; any information provided was in the 2015/2016 timeframe.

2.6.2 If not confirmed, please explain why FEI did not consult with Revelstoke customers prior to the filing of the Application.

Response:

Please refer to the response to BCUC IR 1.2.6.

2.7 Please provide the number of Revelstoke energy users that use heating oil as their fuel source.

Response:

FEI does not have a detailed breakdown of Revelstoke energy users that use heating oil as their fuel source and therefore is unable to provide this information. Instead, the Application refers to Revelstoke's 2012 Community Energy and Emissions Inventory (CEEI).[1] The CEEI contains fuel oil data (GJs/year) for Revelstoke for 2007, 2010 and 2012. Only residential customers are noted in the CEEI data as using heating oil.

2.7.1 Please provide a cost estimate of conversion for the customers identified above.

Response:

As noted in Section 4.2 of the Application, FEI intends to upgrade its propane storage and distribution mains in Revelstoke if sufficient additional demand materializes, whether as a result of the proposal in this Application or otherwise. However, FEI does not intend to convert any customer end-use appliances. Customers wishing to connect would follow the existing FEI System Extension process. If the profitability index passes the threshold, no contribution in aid of construction would be required. Similar to natural gas main extension customers, Revelstoke main extension customers would be responsible for the equipment costs. Based on applications for FEI's Connect to Gas program from Revelstoke over the past 12-month period, the average capital cost is approximately $7,000, with a range of approximately $3,000 to $12,300, to convert from home heating oil to propane.

2.7.2 Please provide an estimate of the reduction in greenhouse gas emissions as a result of Revelstoke customers switching to propane.

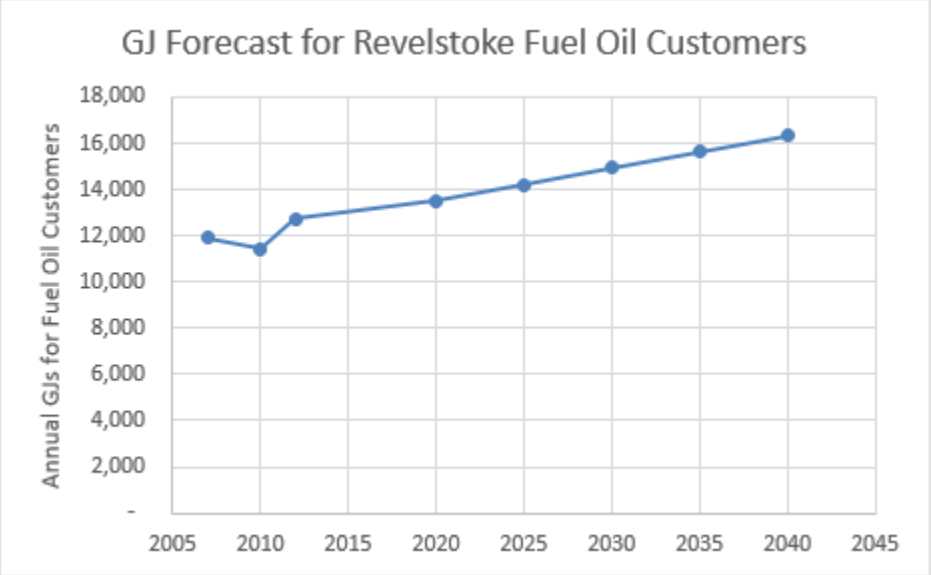
Response:

FEI prepared the following simple linear forecast of heating oil in GJs switching to propane out to 2040 assuming that 100 percent of the heating oil customers are able to switch to propane:

[1] Footnote 6 on page 5 of the Application.

	A	B	C	D	E	F	G	H	I
1	**Residential Customers Switching from Fuel Oil to Propane**	**2007**	**2010**	**2012**	**2020**	**2025**	**2030**	**2035**	**2040**
2	**Heating Oil, GJ**	11,884	11,439	12,723	13,491	14,206	14,920	15,634	16,348

Please note that the blue colored cells in row 2 are from the CEEI whereas the orange cells represent a simple linear projection. Graphically the forecast is:



The Ministry of Environment CO_2e emission factors for fuel oil and propane are:

Fuel	CO2e kg/GJ
Light Fuel Oil	68.37
Propane	61.15

The CO_2e emissions for the Revelstoke fuel oil customers is then:

	A	B	C	D	E	F	G	H	I
1	**Residential Customers Switching from Fuel Oil to Propane**	**2007**	**2010**	**2012**	**2020**	**2025**	**2030**	**2035**	**2040**
2	**Heating Oil, GJ**	11,884	11,439	12,723	13,491	14,206	14,920	15,634	16,348
3	**Light Fuel Oil CO2e @ 68.37 kg/GJ**	812,509	782,084	869,872	922,405	971,235	1,020,066	1,068,897	1,117,727
4	**Propane CO2e @ 61.15 kg/GJ**	726,707	699,495	778,011	824,997	868,671	912,345	956,019	999,693
5									
6	**CO2e Savings, kg**	85,802	82,590	91,860	97,408	102,564	107,721	112,877	118,034

As shown on row 6 of the table above, FEI calculates that if 100 percent of heating oil residential customers switched to propane, CO_2e emissions would be reduced by approximately 100 metric tonnes of per year. However, if fewer than 100 percent of the light fuel oil customers switch to propane, CO_2e savings will be proportionately less, as follows:

% of Light Fuel Oil Customers that Switch to Propane	Metric Tonnes of CO_2e Saved
100%	100
75%	75
50%	50
25%	25

.

2.7.3 Please discuss the likelihood and an estimate of the expected conversion of these customers from heating oil to propane.

Response:

FEI believes some conversions from heating oil to propane will likely occur given the price difference between heating oil and propane.[2] However, FEI is not able to provide an estimate of the expected conversions other than the Upper Bound scenario identified in the Application. The Upper Bound scenario illustrates the Upper Bound impact to FEI's non-bypass customer if all conversions materialize immediately in year 1 after the proposed amalgamation is approved.

FEI believes it is unlikely that all 1,063 residential dwellings identified within 30 metres of an existing main in Revelstoke will convert immediately.

2.8 Please discuss whether the proposed amalgamation is part of a longer-term strategy for FEI in Revelstoke and how the proposed amalgamation supports that longer-term strategy.

Response:

FEI submitted the Application to mitigate rate volatility and provide rate relief for its Revelstoke propane customers. Beyond addressing these key concerns, FEI does not have any separate long-term strategy for Revelstoke. However, FEI notes that, as part of its general strategy, it

[2] NRCan 12-month average heating oil commodity retail price at Kamloops is $34.128 per GJ ($125.3 per litre) including taxes from November 2018 to October 2019; Revelstoke RS 1 effective total rate is $12.522 which includes $10.115 per GJ (commodity and delivery) per Appendix D-1 of the Application and $2.407 per GJ for carbon tax of propane

consistently examines opportunities for cost savings for the benefit of all FEI ratepayers and as described in Section 3.4 of the Application, the approval of Option 1 does not preclude FEI from continuing to review the potential to connect the Revelstoke propane system to natural gas.

2.9 What impact if any, does the proposal have on FEI's Annual Contracting Plan (ACP) and Revelstoke ACP? Please elaborate.

Response:

FEI's Annual Contracting Plan (ACP) is a natural gas supply planning document and therefore will not be impacted by the Application. Revelstoke's ACP proposes contracting strategies that help FEI to procure cost effective propane supply to meet customer requirements. The Application involves changes to the accounting treatment only and does not affect the physical supply of propane or natural gas.

2.10 Please discuss how FEI's proposal supports the creation and retention of jobs.

Response:

Lower and more predictable energy costs tend to result in better economic conditions which drive investment and the creation and retention of jobs.

The Application's proposed Option 1 would mitigate rate volatility and provide rate relief to FEI's Revelstoke propane customers. Energy costs can account for a significant proportion of input costs for commercial and industrial activities. As such, less volatile (and thus more predictable) as well as lower energy input costs could free up funds that commercial and industrial enterprises may use for investments, such as the creation and retention of jobs. Likewise, less volatile and lower energy costs for residential propane customers in Revelstoke, may enable these customers to direct portions of their household funds away from energy demand and towards other forms of consumption that may support local economic activity and thus indirectly lead to the creation and retention of jobs. As outlined in Table 5-1 of the Application, the proposed changes would result in significant average annual bill reductions for Revelstoke customers while average annual bill increases for FEI natural gas customers would remain small.

As noted on page 21 of BCUC Order G-26-13 in the Application for Reconsideration and Variance of Order G-26-14 on the FortisBC Energy Utilities' Common Rates, Amalgamation,

and Rate Design Application, the British Columbia Ministry of Energy and Mines highlighted a similar notion:

> While many factors may affect the competitive position of commercial enterprises in a particular locale, a disadvantage in the area of energy input costs may be significant and lead to diminished economic development and job creation opportunities as a result.

3.0 Reference: AMALGAMATION OPTIONS AND OBJECTIVES

Exhibit B-1, Section 2, p. 3

Public Interest

On page 3 of the Application, FEI states: "... Revelstoke commodity rate stability is in the public interest because it provides benefits to customers and supports BC's energy objectives."

3.1 Please discuss how the proposed changes benefit FEI's natural gas ratepayers.

Response:

As discussed in the response to BCUC IR 1.8.3, FEI had previously explored capital alternatives, such as a physical pipeline and a virtual LNG pipeline, to address the energy cost disparity and volatility experienced by Revelstoke customers. However, each of these capital alternatives included a greater financial impact to FEI's natural gas customers than the proposed alternative. Accordingly, finding a least-cost, innovative non-capital solution to achieve these objectives reduces the impact to FEI's natural gas customers, thereby benefitting them in relation to such alternatives.

The following table outlines the benefits and costs for both FEI's Revelstoke and Non-Revelstoke gas customers.

	Benefits	Costs
Revelstoke customers	1-Increased rate stability of commodity-related rates as they will be amalgamated with the commodity costs of natural gas which are historically more stable; 2-Total annual bill savings of approximately $407 per year for an average Revelstoke propane residential customer with 50 GJ per year consumption; 3-GHG emission reduction in Revelstoke from potential conversion from heating oil to propane; and 4-Encourage economic development and support creation and retention of jobs. Please refer to the response to BCUC IR 1.2.10.	5-No costs to Revelstoke customers.
Non-Revelstoke customers (FEI natural gas customers)	• Overall GHG emission reduction to the Province of BC resulting from potential conversion from heating oil to propane in Revelstoke; • Potential load growth in Revelstoke which lowers overall delivery rate for all FEI	• Small midstream rate impact of approximately $0.98 per year for an average FEI natural gas residential customer with 90 GJ annual consumption.

	Benefits	Costs
	customers; and • Non-capital solution with minimal rate impact to FEI's natural gas customer for providing rate stability and rate relief to Revelstoke propane customers. All other solutions are capital related with higher rate impact to FEI's natural gas customers. Please refer to the response to BCUC IR 1.3.1 and 1.8.3.	

3.2 Please explain whether FEI expects any regulatory, accounting or other efficiencies that would be achieved in the event the proposed amalgamation is approved.

Response:

FEI does not expect any regulatory, accounting or other O&M efficiencies from the proposed amalgamation. The effort required to set the commodity related charges for both FEI's natural gas customers and Revelstoke's propane customers is similar whether the two gas cost portfolios are amalgamated or not. As discussed in Section 3.1 of the Application, the proposed amalgamation does not involve any changes in how the physical propane and natural gas supply resources are planned and managed. FEI plans to continue to prepare and file separate propane and natural gas Annual Contracting Plans as well as individual energy supply agreements with the BCUC for review and acceptance prior to the contracting period. There is also no change to the effort and timing of when storage and transport rates are set.

3.2.1 If so, please discuss whether these efficiencies may result in cost reductions to customers.

Response:

Please refer to the response to BCUC IR 1.3.2.

4.0 Reference: AMALGAMATION OPTIONS AND OBJECTIVES

Exhibit B-1, Section 6, p. 23; Utilities Commission Act (UCA), Sections 58–61

Approvals Sought

On page 23 of the Application, FEI states: "FEI herby applies to the BCUC, pursuant to sections 58 to 61 of the Utilities Commission Act, effective January 1, 2020."

Section 59(1) (a) of the UCA states:

> "a public utility must not make, demand or receive. . . an unjust, unreasonable, unduly discriminatory or unduly preferential rate."

4.1 Please discuss the impact if approval of the Application is not provided in time for a January 2020 implementation date.

Response:

There will be no material impact if approval of the Application is not provided in time for a January 2020 implementation date. While setting storage and transport rates typically occurs once per year within FEI's Fourth Quarter Gas Cost Report, FEI will be able to implement the changes in a subsequent quarterly gas cost report following the decision, such that interim rates are not required.

4.1.1 Please discuss whether having a later implementation date, for example the start of the second or third quarter of 2020, is a viable option.

Response:

Please refer to the response to BCUC IR 1.4.1.

4.1.2 If this is not a viable option, please discuss if other options, such as an interim rate, is workable.

Response:

Please refer to the response to BCUC IR 1.4.1.

4.2 Please discuss how this Application satisfies the requirements of sections 58–61 of the UCA.

Response:

In this response FEI discusses the relevant portions of each of the referenced sections of the UCA followed by a description of how the Application satisfies these requirements, in particular how the commodity cost amalgamation satisfies the requirements of section 59 of the UCA.

Section of the UCA	Requirement	Response
Section 58	Section 58 of the UCA addresses the situations in which the BCUC may order amendment of rate schedules. It states that the BCUC may (on its own motion or through a complaint by a public utility or other interested person) after a hearing determine the just, reasonable and sufficient rates to be observed and in force.	In this Application, FEI is requesting that the BCUC amend rate schedules, and the BCUC has determined that a written hearing is required.
Section 59	Section 59 of the UCA addresses the issue of rate discrimination. It states that a public utility must not make, demand or receive "an unjust, unreasonable, unduly discriminatory or unduly preferential rate for a service provided by it." Section 59 of the UCA also provides that a rate is "unjust" or "unreasonable" if the rate is: (a) more than a fair and reasonable charge for service of the nature and quality provided by the utility; (b) insufficient to yield a fair and reasonable compensation for the service provided by the utility, or a fair and reasonable return on the appraised value of its property; or (c) unjust and unreasonable for any other reason.	The proposal sought by FEI would continue to result in just, reasonable and sufficient rates for both Revelstoke and FEI natural gas customers. Postage stamp rates for the same type of service have been accepted by the BCUC in various instances across the province as being just and reasonable. FEI's Revelstoke propane customers are distinguished from FEI's natural gas customers based on the type of fuel they use. However, geographical location itself is the key cause for this difference in fuel type. To some extent, all customers, even those with the same fuel type, have a different cost of service resulting from their geographical location. Applying equal cost of energy recovery rates to FEI's Revelstoke propane customers is in line with the accepted principle of common rates across geographical locations within

Section of the UCA	Requirement	Response
		FEI's service territory. Please also refer to the response to BCUC IR 1.9.6 where FEI discusses the concept of "unduly discriminatory".
Section 60	Section 60 of the UCA provides broad rate-setting guidelines for the BCUC to consider when determining rates. In setting a rate, the BCUC must consider all matters that it considers to be proper and relevant affecting the rate. The BCUC must have due regard to the setting of a rate that is not "unjust" and "unreasonable" within the meaning of section 59, provides the utility a fair and reasonable return on any expenditure made by it to reduce energy demands, and encourages public utilities to increase efficiency, reduce costs and enhance performance.	See above for the section 59 reference contained in section 60. Further, FEI's proposal is not designed to reduce energy demand, or to increase efficiency, reduce costs and enhance performance for the utility, and the proposal will not alter FEI's return on expenditures. Therefore, those parts of section 60 are not applicable.
Section 60(b.1)	Section 60(b.1) of the UCA gives discretion to the BCUC to "use any mechanism, formula or other method of setting the rate that it considers advisable, and may order that the rate derived from such a mechanism, formula or other method is to remain in effect for a specified period".	The BCUC has the ability to make the kind of rate determination that is being requested by FEI.
Section 60(c)	Section 60(c) of the UCA provides general guidelines for utilities with more than one class of service and states that the BCUC must: (i) segregate the various kinds of service into distinct classes of service; (ii) in setting a rate to be charged for the particular service provided, consider each distinct class of service as self-contained unit; and (iii) set a rate for each unit that it considers to be just and reasonable for that unit, without regard to the rates set for any other unit.	FEI's natural gas and propane customers should be treated as one class of service – the provision of gas. As accepted by the BCUC when approving postage stamp rates for the delivery portion of propane service, there is not a separate class of service under consideration in this Application.
Section 60(2) and (3)	Sections 60(2) and (3) of the UCA provide that in setting a rate, the BCUC may take into account a distinct or special area served by a public utility with a view to setting a rate that provides a reasonable return	The value of the assets used to provide service to Revelstoke is already included in FEI's rate base, and consequently in FEI's postage stamp delivery rates. Since Revelstoke is not currently

Section of the UCA	Requirement	Response
	on the value of the plant or system that provides service in that area. When determining whether to recognize a "distinct or special area" the BCUC should consider all relevant factors in the public interest and must determine a rate that is just and reasonable.	considered a "distinct or special area" and FEI is not seeking any change in this regard, this part of section 60 is not applicable.
Section 61	Section 61 of the UCA requires a public utility to file rate schedules with the BCUC, to receive the BCUC's approval before rescinding or amending a schedule and to charge only those rates that are in accordance with the filed schedules.	FEI will only revise its rate schedules if approved by the BCUC.

Though the Application, if approved, would result in a small annual bill impact for FEI's natural gas customers, it provides a means to address the price volatility and higher energy costs experienced by Revelstoke propane customers by virtue of their geographical location. Further, the Application represents the lowest cost to FEI customers amongst the various means of connecting Revelstoke customers to the natural gas system. Accordingly, approval of the Application, including the small degree of cross subsidization, would not be unjust, unreasonable, unduly discriminatory or unduly preferential.

4.3 Please explain how, as part of the amalgamation to provide rate stability to Revelstoke propane customers, a rate increase to FEI's natural gas customers is not "unduly discriminatory."

Response:

Please refer to the response to BCUC IR 1.4.2.

B. CALCULATIONS AND FORECASTS

5.0 Reference: CALCULATIONS AND FORECASTS

Exhibit B-1, Section 3.2, p. 8; Section 3.3, pp. 12–14, footnotes 14–16

Forecast Load Growth and Calculation Assumptions

On page 8 of the Application, FEI states:

> FEI considered two options for calculating the propane gas cost recovery rates for Revelstoke customers: 1) equal gas cost recovery and 2) a five-year rolling average of the price difference between propane and natural gas. The remainder of this section discusses the two options in detail. This includes an illustration of the commodity related charges for both FEI's natural gas customers and Revelstoke propane customers under each option using the following assumptions:
>
> - Commodity related charges are effective January 1, 2020, assuming the amalgamation occurs on January 1, 2020;
> - Annual consumption of 50 GJ;
>
> …

In footnotes 14 to16 on pages 12 to 13, FEI states:

> "…average annual of $0.99 based on 90GJs per year," footnote 15 states ""… average annual of $0.54 based on 90GJs per year and footnote 16 states "… average annual of $1.98 based on 90GJs per year." [Emphasis added]

5.1 Please provide the annual average consumption in GJ for FEI's Revelstoke propane customer compared to a natural gas customer.

Response:

FEI has provided two comparison tables in response to this question. The first table illustrates the difference between Revelstoke UPC and the average Mainland (Lower Mainland, Inland, Columbia, Vancouver Island and Whistler) UPC over the last ten tears. The second table illustrates the difference between Revelstoke UPC and the average Inland[3] UPC over the last ten years, which is the same region in which Revelstoke is located.

All data is weather normalized.

[3] The Inland Service Area includes the communities as defined in FEI's General Terms and Conditions of its Tariff prior to amalgamation of the FortisBC gas utilities, which occurred on December 31, 2014.

Revelstoke UPC Compared to Mainland UPC

Mainland UPC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10 Yr. avg
Rate Schedule 1	89.7	89.0	87.1	88.5	85.6	85.1	85.2	88.2	86.6	85.9	87.1
Rate Schedule 2	325	316	318	341	332	331	332	339	337	332	330
Rate Schedule 3	3,466	3,463	3,575	3,659	3,593	3,556	3,555	3,695	3,665	3,521	3,575

Revelstoke UPC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10 Yr. avg
Rate Schedule 1	55.9	51.6	54.2	54.0	52.7	51.7	52.7	54.7	56.1	54.6	53.8
Rate Schedule 2	310	309	308	307	297	295	311	301	323	321	308
Rate Schedule 3	4,268	4,893	5,024	6,796	7,321	6,771	9,928	6,468	7,336	7,576	6,638

Difference, UPC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10 Yr. avg
Rate Schedule 1	33.8	37.4	32.9	34.5	32.8	33.4	32.5	33.5	30.5	31.3	33.3
Rate Schedule 2	15.6	7.1	9.9	34.5	34.9	36.0	21.2	38.4	14.1	11.4	22
Rate Schedule 3	(801.3)	(1,429.4)	(1,448.3)	(3,136.6)	(3,728.1)	(3,214.4)	(6,372.8)	(2,773.5)	(3,670.8)	(4,055.5)	(3,063)

Revelstoke UPC Compared to Inland UPC

Inland UPC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10 Yr. avg
Rate Schedule 1	76.9	75.7	74.7	77.0	73.6	75.1	76.1	77.8	76.7	75.6	75.9
Rate Schedule 2	282	276	273	294	284	290	293	293	288	284	286
Rate Schedule 3	3,424	3,495	3,441	3,774	3,664	3,780	4,052	3,872	3,722	3,423	3,665

Revelstoke UPC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10 Yr. avg
Rate Schedule 1	55.9	51.6	54.2	54.0	52.7	51.7	52.7	54.7	56.1	54.6	53.8
Rate Schedule 2	310	309	308	307	297	295	311	301	323	321	308
Rate Schedule 3	4,268	4,893	5,024	6,796	7,321	6,771	9,928	6,468	7,336	7,576	6,638

Difference, UPC	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	10 Yr. avg
Rate Schedule 1	21.0	24.0	20.6	23.0	20.8	23.5	23.4	23.1	20.6	21.0	22.1
Rate Schedule 2	(28.3)	(33.2)	(35.3)	(12.9)	(13.5)	(4.7)	(17.8)	(7.8)	(34.2)	(36.5)	(22)
Rate Schedule 3	(843.9)	(1,398.1)	(1,582.5)	(3,021.7)	(3,657.6)	(2,991.3)	(5,876.3)	(2,596.2)	(3,614.1)	(4,153.5)	(2,974)

5.2 Please confirm, or otherwise explain, that customers in FEI's Mainland and Vancouver Island service area use 40GJ per year more than Revelstoke customers.

Response:

Please refer to the responses to BCUC IRs 1.5.1 and 1.5.3.

5.2.1 If confirmed, please provide an explanation for this 40 GJ variance.

Response:

FEI cannot definitively explain and does not have quantitative evidence as to why Revelstoke propane residential customers historically use, on average, less than FEI's natural gas residential customers. FEI believes this may be a result of many factors that may also be compounding, such as:

- Number and age of occupants;
- Customer behavior;
- Dwelling size;
- Housing formations;
- Possible secondary heating sources such as wood fireplaces or electric heating;
- Number of appliances per dwelling;
- Seasonal homes;
- Local government conservation policies and activities; and
- Economic activities.

FEI expects the demand of Revelstoke residential customers will continue to result from various factors that cannot be isolated.

5.3 Please explain why FEI used different assumptions related to annual consumption (50GJ for Revelstoke propane customers and 90GJ for a typical residential natural gas customer) to calculate the costs and benefits of the proposed amalgamation.

Response:

FEI used 50 GJ per year for Revelstoke propane residential customers and 90 GJ per year for natural gas residential customers to demonstrate the annual bill impact of the proposed amalgamation because those are the respective approximate average annual use per customer figures. As shown in response to BCUC IR 1.5.1, although the actual average use per customer varies annually, historically it has remained in close approximation to 50 GJ per year for Revelstoke and 90 GJ per year for FEI's Mainland natural gas residential customers. As such, for simplicity and for demonstration purposes, FEI used 50 GJ per year and 90 GJ per year to

represent the average use per customer for FEI's Revelstoke and Mainland natural gas residential customers, respectively.

FEI also notes that the use of average consumption (such as 50 GJ per year and 90 GJ per year for FEI's Revelstoke and Mainland natural gas residential customers, respectively), to demonstrate bill impacts is consistent with FEI's other filings such as the annual reviews and quarterly gas cost report for both FEI's natural gas and Revelstoke propane costs. There are too many variations in individual consumption to illustrate individual bill impacts, although it is possible to show minimum and maximum bill impacts such as is shown in response to CEC IR 1.6.1.

FEI further clarifies that the purpose of Figure 2-2 in the Application which used a common 50 GJ per year is to demonstrate the potential benefits to Revelstoke propane customers if they are on similar rates as FEI's natural gas customers. It is not to highlight the difference in total bill between an average Revelstoke residential customers consuming 50 GJ per year against an average FEI natural gas customer consuming 90 GJ per year.

6.0 Reference: CALCULATIONS AND FORECASTS

Exhibit B-1, Section 4.1, pp. 16–17; Appendix B, Section 2, p. 3

UPC Projections

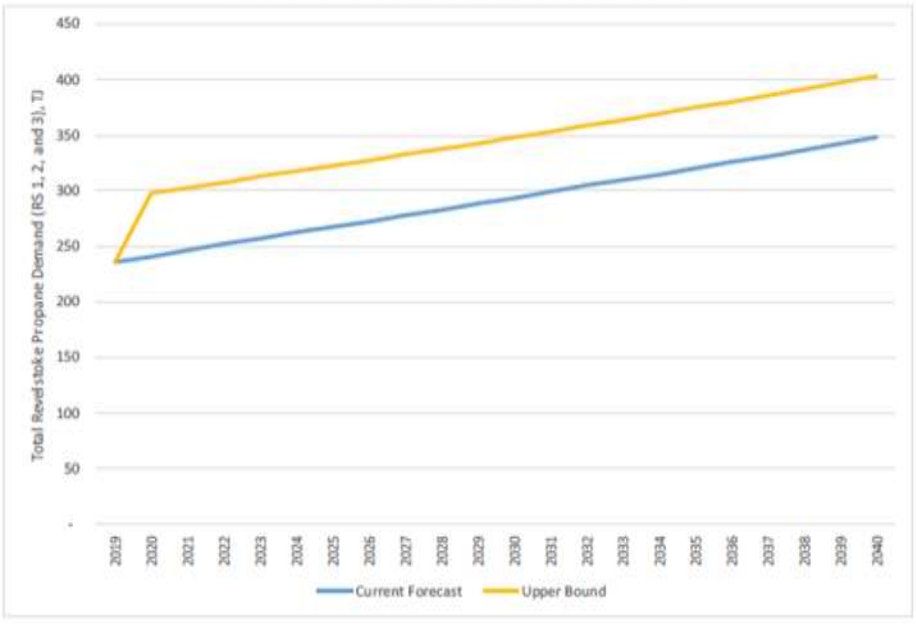
On page 3 of Appendix B of the Application, FEI states: "…individual UPC projections for each residential and commercial rate schedule are developed by considering the recent (three-year) historical weather-normalized UPC."

On page 16 of the Application FEI states:

> The annual demand forecast for residential and commercial customers relies on two components:
>
> - Average use per customer (UPC) forecast; and
> - Customer forecast.

On page 17, FEI provides the following chart:

Figure 4-2: Total Annual Propane Demand in TJs



Specifically, the average UPC is estimated for customers served under RS 1, 2 and 3 and is then multiplied by the corresponding forecast of the number of customers (opening number of customers plus average net customer additions during the year) in these rate schedules to derive energy consumption.

6.1 Please explain if FEI expects the individual UPC projections for each rate schedule to differ from forecast when accounting for potential increased consumption as a result of a lower rate for propane.

Response:

FEI assumes that the use rates for existing customers will remain relatively constant and might increase or decrease over time for various factors not related to the cost of commodity. Use rates are dependent on occupant comfort level, their conservation behavior, building envelope and installed equipment. FEI does not believe that new or existing customers would appreciably change, immediately or in the near term, their required comfort level (e.g., current thermostat setting), their conservation behavior, the building envelope or installed equipment due to a change in the commodity cost.

In economics, the price elasticity of demand is used to analyze the relationship between rate changes and demand (based on changes in the price alone). In general, third party price elasticity studies have shown that gas consumers (natural gas and propane), particularly residential customers, have low price elasticity of demand, meaning that the demand for natural gas does not significantly change with the changes in price level.

The following table shows a simple correlation analysis between rates (i.e., revenue per GJ) and energy demand (UPC) for Revelstoke over the last 10 years. The correlation coefficients for all rate classes are low which indicate that there is no correlation between the rates and energy demand. FEI also notes that the rates in both 2010 and 2016 were lower than other years and are at similar levels as the estimated rates after the proposed amalgamation as shown in Appendix D-1 of the Application (i.e., $10.115 per GJ for Rate Schedule 1 and $8.789 per GJ for Rate Schedule 2). However, the demand (i.e., UPC) of both residential and commercial customers for these two years remained approximately the same as the years before and after 2010 and 2016. For these reasons, FEI did not feel that price elasticity analysis was warranted, and it is FEI's view that factors other than rates, such as those noted above, have a more significant impact on customer demand than rates.

Revenue per GJ	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Rate Schedule 1	18.069	12.687	22.728	21.450	17.999	23.612	17.798	13.446	16.566	19.028
Rate Schedule 2	15.006	10.510	19.504	18.336	14.444	20.241	14.121	9.933	13.194	15.358
Rate Schedule 3	13.988	9.252	18.381	17.486	13.180	18.946	12.144	8.645	11.953	14.073

Revelstoke UPC (GJ)	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Rate Schedule 1	55.9	51.6	54.2	54.0	52.7	51.7	52.7	54.7	56.1	54.6
Rate Schedule 2	310	309	308	307	297	295	311	301	323	321
Rate Schedule 3	4,268	4,893	5,024	6,796	7,321	6,771	9,928	6,468	7,336	7,576

Correlation Coefficient (R)	
Rate Schedule 1	(0.09)
Rate Schedule 2	(0.20)
Rate Schedule 3	(0.09)

6.1.1 If so, please provide any relevant analysis for the expected increase in UPC.

Response:

Please refer to the response to BCUC IR 1.6.1.

6.2 Please provide any relevant analysis of elasticity assumptions used to forecast UPC.

Response:

Please refer to the response to BCUC IR 1.6.1.

6.3 Please confirm, or otherwise explain, that the forecast total Revelstoke propane demand as per Figure 4-2 uses UPC forecasts based on current propane pricing.

Response:

Confirmed, although as explained above, they would not differ based on other pricing.

6.3.1 Please update Figure 4-2 to include the forecast total Revelstoke propane demand based on the lower propane rate as proposed in the Application and FEI's elasticity assumptions.

Response:

FEI's demand forecast is based on a time-series forecast of UPC and CBOC-based customer additions forecast. Commodity pricing and elasticity are not direct inputs to the demand forecast method. Also, as discussed in response to BCUC IR 1.6.1, there is no or very low correlation between rates and energy demand; as a result there would be no meaningful change to Figure 4-2.

7.0 Reference: CALCULATIONS AND FORECASTS

Exhibit B-1, Section 4.1, pp. 15–17

Customer Conversion & Connection Costs

On page 15 of the Application, FEI states:

> Based on FEI's geographic information system (GIS), FEI identified 1,063 residential dwellings within 30 metres of an existing main in Revelstoke that are currently not FEI Revelstoke propane customers. Since there are incremental connection costs associated with residential dwellings that are greater than 30 metres from an existing main, FEI believes these dwellings represent the extent of the customers that are likely to consider conversion to propane service. Since the number and evolution of conversions over time is uncertain, FEI assumed all identified 1,063 residential dwellings will connect to FEI's propane system in Revelstoke in 2020 to illustrate an Upper Bound delivery rate impact on FEI and Revelstoke customers. FEI notes that no conversion additions were forecasted for commercial customers in Revelstoke under this Upper Bound scenario as FEI assumes commercial customers that have the ability to take propane service have done so already.

On page 17 of the Application, FEI states:

> [I]n the unlikely event that all 1,063 residential dwellings identified within 30 metres of an existing main in Revelstoke convert to propane immediately in 2020, the total propane demand in Revelstoke is forecasted to increase by approximately 26 percent, from the current forecast demand of 236 TJ to 298 TJ in 2020.

7.1 Please provide an estimate of the total number of residential dwellings that FEI expects to convert to propane.

Response:

FEI will connect customers wishing to convert to propane, subject to the customers meeting the system extension requirements as currently set out in the tariff. Similar to natural gas customers, propane customers are responsible for any costs downstream of the meter including, but not limited to appliance and gas piping costs. FEI understands that there are approximately 1,063 residential dwellings within 30 metres of existing mains that are not currently customers of FEI. It has been FEI's experience that when energy at natural gas prices is offered to potential customers, there is a greater likelihood that those customers will connect to the system. However, FEI does not have an estimate of the total number of residential dwellings that would convert to propane. A detailed survey of premises located within the area served by the existing system would need to be conducted for FEI to have

sufficient information to provide a reasonable estimate of customers who would choose to convert.

7.2 Did FEI perform any analysis on the likelihood of the Upper Bound scenario? Please discuss.

Response:

FEI did not attempt to assign a probability to the upper bound scenario. Rather, the Upper Bound scenario was chosen because it represents the scenario with the largest delivery rate impact. As such, any other scenarios would have an impact less than the Upper Bound scenario. Please also refer to the response to BCUC IR 1.7.3.1.

7.2.1 If yes, please provide any relevant analysis with accompanying data.

Response:

Please refer to the response to BCUC IR 1.7.2.

7.2.2 If not, why not?

Response:

Please refer to the response to BCUC IR 1.7.2.

7.3 Please discuss the estimated value of the “incremental connection costs” for residential dwellings greater than 30 meters from an existing main.

Response:

FEI cannot estimate the value of the "incremental connection costs" for residential dwellings greater than 30 metres as the connection cost depends on, among other things, the distance from FEI's existing main, number of customers wishing to connect, and the anticipated connected load. FEI notes that 30 metres was used in the Application to identify the Upper Bound potential of new residential customers because it is up to this distance that, historically, FEI has seen customers connect to the system. The likelihood of customers attaching who are beyond 30 metres is much lower as the incremental cost to connect and the associated contribution in aid from the customer discourages connection.

7.3.1 Please explain how these costs compare with the value of potential savings made from switching to propane service in the event the application is approved.

Response:

Buying decisions from customers are generally both emotional and financial. Customers are emotionally motivated to move to propane for the ability to have new modern appliances (such as on demand water heaters and boilers, cooktops and fireplaces), reduced emissions and convenience of a piped energy source. Financial drivers are the result of a lower or equal cost compared to alternatives.

From a financial perspective, any customer attaching to either the natural gas or propane system has to consider the cost of the gas/propane equipment, building modifications (venting, etc.) and the cost paid to FEI to connect to the system. These costs on their own must be similar or lower than the alternative energy source. After considerations of these costs, customers consider the cost of operation. If these costs are lower than the incumbent fuel the customer may compare operational cost savings to the costs to connect. The greater the operational savings (and lower the connection related costs) the more likely the customer is to attach to the system. Therefore, the further the customer is away from the FEI system, the greater the connection costs and the higher the operational savings will need to be to encourage connection.

Based on applications for FEI's Connect to Gas program from Revelstoke over the past 12-month period, the average capital cost is approximately $7,000, with a range of approximately $3,000 to $12,300, to convert from heating oil home to propane. The simple payback based on the average conversion cost is approximately 6 years[4], but can be as high as 11 years based on

[4] Based on NRCan 12-month average heating oil retail price at Kamloops of $34.128 per GJ ($125.3 per litre) including taxes from November 2018 to October 2019; Revelstoke RS 1 effective rate of $10.115 per GJ per

the highest conversion cost, assuming no contribution from the customer with the residential dwelling located less than 30 metres from FEI's existing main.

Given the length of the payback period that each individual residential owner will have to consider, FEI believes it is unlikely that all 1,063 residential dwellings identified within 30 metres of an existing main in Revelstoke will convert immediately, and even less likely for those residential dwellings located more than 30 metres away. FEI believes the conversions could materialize over time.

7.4 Please clarify the basis for the assumption that there would be no additional conversions for commercial customers in Revelstoke.

Response:

No commercial conversions were forecast as the likelihood of existing commercial customers attaching is very low due to the following factors:

- FEI experienced a total of 4 applications over the last 5 years from commercial properties in Revelstoke to connect to propane from heating oil; and
- The most recent 2012 CEEI (Province of BC Community Energy & Emissions Inventory) report[5] showed that there are no commercial or small-to-medium industrial properties that use heating oil.

FEI believes that, given the existing and historical price differential between heating oil and propane, commercial customers would most likely have already converted from heating oil to propane. For example, assuming a small commercial customer in Revelstoke that uses heating oil has a similar energy requirement as an average commercial propane customer of 310 GJ per year under FEI's Rate Schedule 2, the annual savings based on the current price of heating oil versus propane will be approximately $5,400 per year[6]. From a business perspective, FEI believes, if the individual commercial customer has been continuing to use heating oil as their

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Appendix D-1 of the Application plus $2.407 per GJ for carbon tax of propane; and 50 GJ of annual energy demand (assumed both propane and heating oil appliances efficiency at 80 percent). Calculation does not include Connect to Gas incentive from FEI which can range from $1,300 to $2,700. If included, simple payback can be reduced to 5 years for the average conversion cost of $7,000 from heating oil to propane home.

5 https://www2.gov.bc.ca/gov/content/environment/climate-change/data/ceei

6 Based on NRCan 12-month average heating oil retail price at Kamloops of $34.128 per GJ ($125.3 per litre) including taxes from November 2018 to October 2019; Revelstoke RS 2 effective rate of $14.351 per GJ under existing separate portfolio per Appendix D-1 of the Application plus $2.407 per GJ for carbon tax of propane; and 50 GJ of annual energy demand (assumed both propane and heating oil appliances efficiency at 80 percent).

primary fuel type given the level of cost savings available, it is for reasons not related to the price of propane.

However, if there are new commercial business that start up in Revelstoke, and those customers pass the system extension test, the likelihood of connection to the propane grid is high.

8.0 Reference: CALCULATIONS AND FORECASTS

Exhibit B-1, Section 4.2, pp. 17–18

Revelstoke Propane System & Capital Costs

On pages 17–18 of the Application, FEI states:

> Based on the forecasted growth under the Upper Bound scenario, the existing distribution system in Revelstoke will require three additional propane storage tanks and a distribution main upgrade in order to serve Revelstoke's existing customers as well as the additional load from the conversions as described in Section 4.1 above. The capital upgrades will have to be implemented immediately in the first year after the proposed amalgamation of propane and natural gas costs begins as the Upper Bound scenario assumes all additional conversions occur in the first year after the proposed amalgamation becomes effective. The total capital cost for the upgrade is estimated to be $2.798 million in 2019 dollars.

8.1 Please confirm the number and associated propane capacity of the storage tanks currently in operation in Revelstoke.

Response:

The Revelstoke Propane Plant currently has nine storage tanks on site. Each storage tank has a capacity of 30,000 US gallons and can be filled with propane to a maximum of 80 percent of the tank capacity. Therefore, the maximum on site storage currently available is 216,000 US gallons.

8.1.1 Please provide photos or diagrams of the storage tanks and system currently in operation.

Response:

Below is an aerial view of the existing propane storage and vapourization facility in Revelstoke (with North at top of photo). The vapourization facilities are in the building south of the tanks, and rail off-loading station is at the east side of the property.

Storage Tanks (6 of 9 on site)

Propane Vapourizers

Rail Off-Loading Station

8.1.2 Please provide the number of days the current storage facilities are able to serve Revelstoke supply.

Response:

For 2019, with all nine storage tanks full, the tank capacity is sufficient to supply Revelstoke for the nine coldest days in a design year.

8.2 Please clarify the impact to the total capital cost for the upgrade if additional commercial customers were to switch to propane.

Response:

As discussed in the response to BCUC IR 1.7.4, FEI is not expecting additional commercial customers in Revelstoke to switch to propane. However, the potential upgrades to the Revelstoke plant that would be required to support the 1,063 residential conversions captured in the Upper Bound scenario is also sufficient to support the equivalent of an additional 150 average small commercial customers before requiring any additional plant upgrades. FEI believes the currently identified upgrades allow room for additional commercial growth should it materialize with little or no additional impact to the total capital cost.

8.3 Please provide an estimate of the cost of upgrading the existing storage and distribution system compared to connecting Revelstoke to the natural gas mainline.

Response:

During 2015 and 2016, FEI investigated the potential to connect Revelstoke to the natural gas system. At that time, FEI investigated two potential alternatives: a physical natural gas transmission pipeline from Salmon Arm or a conversion to LNG (i.e., a “virtual pipeline”).

The table below provides a comparison between the Upper Bound scenario of the Application and the high-level estimate from 2015 for a physical pipeline from Salmon Arm as well as a virtual LNG pipeline from FEI’s LNG facility in Tilbury, stated in 2019 dollars with inflation. From a financial perspective, propane continues to be the least cost option to serve Revelstoke as opposed to natural gas via a virtual LNG pipeline or a physical pipeline. For example, propane costs for Revelstoke are approximately $2.239 million annually based on 2020 forecasts as

compared to $6.200 million or $30.600 million of incremental annual revenue requirement associated with LNG or a physical pipeline, respectively.

As demonstrated in the table below, the current Application for amalgamating FEI's propane and natural gas supply cost portfolios represents a least cost, innovative non-capital solution to virtually connecting Revelstoke customers to the natural gas system. The Application minimizes the potential impact to natural gas ratepayers while also alleviating the geographic disadvantage faced by Revelstoke customers whose energy costs currently reflect this disadvantage via the cost of propane. In accordance with common rate setting principles, the Application treats Revelstoke customers in the same manner as other gas customers whose rates are set without regard to their geographic condition. Thus, the Application conserves resources and represents a fair and reasonable solution to overcome geographic disparity impacting energy costs in Revelstoke.

	Proposed Gas Cost Amalgamation - *Revelstoke Propane System Upgrade @ Upper Bound Scenario* (2019$)	**Virtual LNG Pipelilne (2019$)**	**Physical Natural Gas Pipeline (2019$)**
Capital Costs	$ 2.798 million (If all identified Upper Bound conversions materialize immediately)	$ 26 million	$ 308 million
O&M Costs (Annual)	n/a	$ 1.2 million	$ 0.380 million
Avg. Annual Cost of Service (by Revelstoke or FEI's customers)	$ 2.239 million (Forecast 2020 Propane Costs)	$ 6.200 million (Levelized Annual Incremental Revenue Requirement)	$ 30.600 million (Levelized Annual Incremental Revenue Requirement)
Incremental Rate Impact to FEI's customers, incl. Revelstoke	$ 0.011/GJ (Midstream Rate Impact)	$ 0.027/GJ (Delivery Rate Impact)	$ 0.200/GJ (Delivery Rate Impact)
FEI Annual Bill Impact (Avg. FEI residential @ 90 GJ per year)	$ 0.98	$ 2.43	$ 18.00
Revelstoke Annual Bill Relief (Avg. residential @ 50 GJ per year)	($407)	($ 406) Assume no contribution from Revelstoke	($ 397) Assume no contribution from Revelstoke

FEI notes that the above table does not differentiate whether the cost of service will be borne by Revelstoke's customers only, by all FEI's customers which include Revelstoke under the postage stamp delivery rates, or by a combination of FEI's customers with some form of contributions from other parties such as the City of Revelstoke or other levels of government. Rather, the purpose of the table is to highlight the fact that the proposed Application as a non-capital solution will have the least impact to all parties regardless if the impact is borne by Revelstoke's customers, FEI natural gas customers, or other parties in terms of any contribution that might be required.

FEI also notes the following:

- The three solutions identified above provide the same rate stability for Revelstoke customers;
- The Upper Bound scenario of the Application includes the impact of all 1,063 residential dwellings within 30 metres of an FEI main converting to propane immediately following the approval of the Application. However, as noted in Section 4.2 of the Application, FEI intends to upgrade propane storage and distribution mains in Revelstoke only if the forecast demand materializes in the future, and the incremental revenue requirements due to these upgrades will be offset by the additional revenues from these new customer additions;
- Both the physical pipeline and the virtual LNG pipeline estimates include the capital costs to convert or upgrade existing customer propane appliances, regulators, etc. to natural gas;
- O&M costs per year under virtual LNG pipeline relate to operations of the LNG plant vaporization plant in Revelstoke as well as LNG transportation from Tilbury. O&M costs per year under the physical pipeline relate to additional integrity and sustainment related work for the new pipeline; and
- A CNG virtual pipeline was also investigated in 2015, but was deemed not feasible as it was unable to meet the on-site storage requirement of 7 days supply.

8.4 Please explain if the additional storage tanks and distribution main upgrade would be compatible if the Revelstoke propane system was to be converted to use another fuel source such as liquefied natural gas (LNG) or compressed natural gas (CNG).

Response:

The additional storage tanks that would serve a propane distribution system would not be compatible with LNG or CNG service. LNG and propane have different material requirements for storage tanks and different approaches to vapour management for the tanks. CNG storage requires tanks capable of withstanding significantly higher operating pressures. Conversely, distribution main upgrades would be compatible with any future conversion to an LNG or CNG supplied system.

8.5 Please discuss to what extent the proposed cost amalgamation increases the likelihood that these capital upgrades will be required.

Response:

Under the current forecast shown in Figure 4-2 of the Application, which assumes no incremental conversions of residential customers, FEI does not expect that an expansion or upgrade of the Revelstoke propane plant or distribution main will be required over the next 20 years. As discussed in Section 4 of the Application, FEI believes the proposed amalgamation will likely accelerate load growth in Revelstoke with conversions from other fuel types, which will therefore trigger capital upgrade sometime in the future for Revelstoke distribution system.

However, FEI emphasizes that the Upper Bound scenario, where all 1,063 identified residential dwellings located within 30 metres of an existing main convert immediately in year 1 after the proposed amalgamation is approved, is unlikely to occur. Rather, the Upper Bound scenario was simply used to illustrate the extent of conversions that could be potentially triggered over time by the proposed amalgamation.

FEI believes the actual conversion will occur over time and the actual capital upgrade requirement could occur in 5 to 20 years, or even further in the future. As discussed in BCUC IR 1.8.5.1, the delivery rate impact of the Upper Bound scenario is small at 0.011 percent or $0.0004 per GJ to FEI's non-bypass customers (including Revelstoke customers). This is equivalent to approximately 4 cents annually for an average FEI natural gas residential customer consuming 90 GJ per year. The actual delivery rate impact to FEI's non-bypass customers will be smaller since the actual capital upgrade will be unlikely to occur in year 1 after the proposed amalgamation.

8.5.1 Please explain how the costs for the upgrade will be recovered, including any impact on rates.

Response:

Revestoke's propane customers are under the same postage stamp delivery rates as all FEI's natural gas customers, therefore, the cost of the capital upgrades will be recovered from all FEI's non-bypass customers, which include Revelstoke, through the postage stamp delivery rates. Section 4 of the Application shows the impact on these common delivery rates of any required capital upgrades.

Table 4-2 of the Application (copied below) shows that, in the unlikely event that the Upper Bound scenario occurs, the estimated delivery rate impact to FEI's non-bypass customers is approximately 0.011 percent or $0.0004 per GJ. For an average FEI natural gas residential

customer consuming 90 GJ per year, this is equivalent to approximately 4 cents annually. For an average Revelstoke propane residential customer consuming 50 GJ per year, this is equivalent to approximately 2 cents annually. FEI notes that, as discussed in the response to BCUC IR 1.8.5, the actual delivery rate impact is likely to be much less than the Upper Bound scenario as the actual capital upgrade is unlikely to be required immediately in the first year after the proposed amalgamation is approved.

Line	Particular	Reference	Incremental Impact (Upper Bound)
1	2020 Incremental Revenue Requirement to 2019 Approved ($000s)	Appendix C, Line 11	(63)
2	2021 Incremental Revenue Requirement to 2019 Approved ($000s)	Appendix C, Line 11	91
3	Cumulative Incremental Revenue Requirement - first two years ($000s)	Line 1 + Line 2	28
4	2019 Approved Revenue Requirements, Non-Bypass ($000s)	BCUC Order G-10-19	814,155
5			
6	2020 % Delivery Rate Increase to 2019 Rates	Appendix C, Line 17	(0.008%)
7	2021 % Delivery Rate Increase to 2020 Rates	Appendix C, Line 17	0.019%
8	Cumulative % Increase to 2019 Rates, Non-Bypass - first two years	Line 6 + Line 7	0.011%
9			
10	2019 Approved Effective Delivery Rate ($/GJ)	Line 4 / 2019 Non-bypass TJ	4.039
11	**Cumulative Effective Rate Increase - first two years ($/GJ)**	**Line 8 x Line 10**	**0.0004**
12	Annual Delivery Rate Impact @ 50 GJ per year ($)	Line 11 x 50 GJ/yr	0.02
13	Annual Delivery Rate Impact @ 90 GJ per year ($)	Line 11 x 90 GJ/yr	0.04

8.6 Please explain whether FEI considered additional storage as a means of smoothing rates to account for seasonal variability.

Response:

FEI did not consider the use of additional physical storage at Revelstoke as a means to reduce seasonal propane price variability. The propane storage tanks currently located at Revelstoke provide operational benefits but do not offer sufficient storage capacity to provide seasonal price protection. Although FEI did not investigate the use of additional physical storage at Revelstoke, the Revelstoke supply portfolio has over the past number of years included third party contracting for fixed price purchases or Alberta based propane storage to hedge winter propane price exposure; FEI has contracted for approximately 50 percent of Revelstoke's winter propane requirements using these types of hedging instruments.

FEI currently has nine propane storage tanks in operation at Revelstoke. FEI would need to approximately triple the number of propane storage tanks to provide the equivalent capacity that Revelstoke, on average, has utilized annually within its propane supply portfolio for winter price protection. FEI has not investigated the installation and use of additional propane storage tanks

at Revelstoke to provide sufficient storage capacity to offer seasonal price protection; further analysis of such an alternative would require consideration of a number of variables, including availability of suitable land, safety, operational and community impact considerations, and cost.

FEI's proposal provides a solution that will provide Revelstoke customers with propane rate stability matching the stability of FEI's natural gas rates, and that can also provide propane commodity cost relief to Revelstoke customers. The rate stability component of the solution addresses that, in general, commodity prices for propane have historically been more volatile than natural gas prices. This is broader than just seasonal variability in commodity prices. The current rate setting mechanisms for propane, as well as natural gas, are based on the 12-month prospective forward prices which already removes seasonal variations in the gas costs utilized in the quarterly review and, if warranted, resetting of gas cost recovery rates.

The FEI natural gas supply portfolio includes a level of physical storage which provides both operational and financial value. The primary financial benefit includes seasonal price protection by capturing the price differential between summer (when the majority of the storage injections occur) and winter (when the majority of the storage withdrawals occur).

8.6.1 If so, please discuss the advantages and disadvantages of such an approach.

Response:

Please refer to the response to BCUC IR 1.8.6.

8.6.2 If not, please explain why not.

Response:

Please refer to the response to BCUC IR 1.8.6.

C. RATES

9.0 Reference: COMMODITY RATE SETTING

FEI's Application for Approval of 2019-2020 Revenue Requirements and Rates for the Fort Nelson Service Area (2019-2020 Fort Nelson RRA), G-48-19, Appendix A, p. 7; Exhibit A2-2, FortisBC Energy Utilities (FEU), comprised of FortisBC Energy Inc. (FEI), FortisBC Energy (Vancouver Island) Inc.) (FEVI), FortisBC Energy (Whistler) Inc. (FEW), and FortisBC Energy Inc. Fort Nelson Service Area (FEFN or Fort Nelson) Common Rates, Amalgamation and Rate Design Application, Exhibit B-9, BCUC

Information Request (IR) 7.2.4; p.35

Postage Stamp Rates

Page 7 of Appendix A to Order G-48-19, which accepted, among other things, FEI's requested rate increases in its 2019-2020 Fort Nelson RRA application, states:

> FEI submits that it cannot predict when FEI would apply for postage stamp rates for FEFN or when FEFN's residential customers will no longer experience a rate impact from moving to FEI's rates. FEI explains that this is because "there are a number of factors and circumstances, some beyond FEI's control, that could lead to the rate impact being reduced or increased in the near future." FEI provides the following examples where the rate impact to FEFN's residential customers from moving to FEI's rates would be reduced:
>
> - If FEFN continues to experience negative growth in residential customers and natural gas demand in all rate classes continues to decline;
> - If FEFN's system requires capital investments of $1 to $2 million to address integrity concerns or for other sustainment projects; or
> - If FEI continues to have delivery rate increases of zero to one percent in the rest of FEI's service areas.

9.1 Please discuss whether any of the bullets stated in the preamble explain the current status of FEI's Revelstoke service area, with respect to: i) negative growth in propane demand, ii) capital investment requirements to address integrity concerns or other sustainment projects, or iii) delivery rate increases of zero to one percent in the rest of FEI's service areas.

Response:

None of the bullets stated in the preamble apply to FEI's Revelstoke service area.

First, Revelstoke's propane demand has been slowly increasing over the last 10 years.

Second, Revelstoke is already under the same postage stamp delivery rates as FEI's natural gas service areas, therefore, Revelstoke will experience the same delivery rate increase or decrease as FEI's natural gas non-bypass customers and the concern of recovering the capital investment from Revelstoke's customers to address the integrity of the propane distribution is not applicable. Under this Application, FEI is proposing a postage stamp commodity related rate between FEI's natural gas service areas and Revelstoke propane service area to address the high volatility and high propane commodity rates for Revelstoke. Conversely, the postage stamp rate referenced in the preamble refers to a postage stamp delivery rate between FEI and FEFN.

Third, Revelstoke customers currently have a higher total rate (commodity related rate plus delivery rate) than FEI's natural gas customers, therefore, Revelstoke's customers will experience a rate benefit from a postage stamp commodity rate with FEI. This is opposite for FEFN where FEFN's residential customers currently have a lower total rate than FEI, and thus will generally experience a rate increase from a postage stamp delivery rate with FEI at this time.

Page 14 of the Application states:

> Fully amalgamating the propane and natural gas portfolio costs on an equal basis (as proposed in Option 1) ensures that FEI customers in Revelstoke do not experience differing cost of energy recovery rates due to their location within FEI's service territory.
>
> FEI's Revelstoke propane customers are different from FEI's natural gas customers because they use a different fuel type. However, geographical location itself is the key cause for this difference in fuel type. As such, applying equal cost of energy recovery rates to FEI's Revelstoke propane customers represents an improvement to the current situation in line with the accepted principle of common rates across geographical locations within FEI's service territory…

Page 19 of the Application states:

> A typical residential natural gas customer in the FEI Mainland and Vancouver Island service area would experience an approximate overall annual increase of $0.04, based on an average usage of 90 GJs per year.

In Exhibit A2-2, FEI's response to BCUC IR 7.2.4 stated:

Revelstoke currently has postage stamped delivery rates. The propane commodity cost is flowed through to Revelstoke customers, just as the natural gas commodity cost is flowed through to FEI's natural gas customers. The FEU have no current plans to postage stamp the commodity or midstream costs for Revelstoke as propane is a different fuel type than the natural gas delivered to the Companies' other customers.

9.2 Please discuss the reasons why FEI, then FEU, chose not to postage stamp the commodity or midstream costs for Revelstoke as part of its amalgamation of FEI, FEVI, FEW and FEFN.

Response:

The main focus of the application filed by FEI, then FEU, in 2012 was to amalgamate three separate corporate companies (FEVI, FEW, and FEI which includes FEFN) and implement a common postage stamp rate for the amalgamated company. Each of the three separate companies had its own rate base for rate-setting purposes prior to 2012; and FEFN, while not a separate legal entity, is operating as a separate utility and also has its own rate base for rate-setting purposes.

Revelstoke, on the other hand, is not a separate legal entity of FEI and it does not have its own rate base for rate-setting purposes. Revelstoke has been part of FEI's service area since 1991 and has been under the same postage stamp delivery rate as the rest of FEI's natural gas non-bypass customers since 1991. As the focus of the 2012 application was to amalgamate four distinct rate bases, FEI, at that time, did not want to further complicate the application with a separate and distinct matter related to Revelstoke.

Exhibit A2-2 filed by BCUC Staff in the referenced proceeding includes 'FEU' responses to BCUC IRs from the 2012 Common Rates, Amalgamation and Rate Design Application. IR 7.2.4 asked, "If this objective is accepted by the Commission, do FEU plan to request postage stamp rates for Revelstoke customers? Please explain why or why not."

Part of FEI's response was the following:

> The objective of removing rate discrepancies is not novel as it is reflected in all postage stamp rate designs. Accepting this objective would therefore be consistent with existing postage stamp rate designs in the province and would not set a new precedent.
>
> Revelstoke currently has postage stamped delivery rates. …

FEI then went on say that [in 2012] it had no plans to postage stamp the commodity or the midstream costs for Revelstoke. FEI stated that it was streaming propane commodity costs to

Revelstoke customers since they consumed propane and natural gas commodity and midstream costs were being streamed to FEI sales customers that consume natural gas.

Historically, FEI had differentiated natural gas commodity / midstream recovery rates for the different predecessor utilities and regions. These were primarily a function of continued historical practices / methodology. In 2015 the 'regional' natural gas costs were postage stamped as part of the BCUC-approved amalgamation. Both because the way in which costs were being incurred had changed and because it was impossible to be able to identify exactly which costs were the responsibility of which geographic location, and that all costs were being incurred to provide the least cost while ensuring all firm service customers receive gas.

Furthermore, FEI, at that time, was contemplating the potential of connecting Revelstoke with FEI's natural gas system via either a physical pipeline or a virtual LNG/CNG pipeline. As such, FEI did not consider applying for a postage stamp rate for Revelstoke together with the amalgamation application believing, at that time, that the project to connect Revelstoke could happen in the near future.

9.2.1 Please discuss the factors that have changed since the FEVI, FEW and FEFN amalgamation application and the impact on FEI's decision to propose amalgamation at this time.

Response:

As discussed in response to BCUC IR 1.9.2, FEI was contemplating the potential of connecting Revelstoke with FEI's natural gas system via a physical pipeline or a virtual pipeline at the time of the FEI, FEVI, FEW, and FEFN amalgamation application. FEI had investigated such a project from 2015 to 2016 (as discussed in response to BCUC IR 1.8.3) which was deemed not economically feasible at that time.

Although the project was determined to not be economically feasible (see the response to BCUC IR 1.8.3), at this time it became apparent that Revelstoke customers felt that they were negatively impacted by the costs and volatility of propane prices (please also refer to the response to BCUC IR 1.2.5). When the project to connect Revelstoke to FEI's natural gas system was put on hold in 2017, the City of Revelstoke asked FEI if there are other mechanisms to provide rate relief to Revelstoke customers and specifically if postage stamp rates could be applied to Revelstoke as they were to Vancouver Island.

FEI has since investigated other mechanisms and believes the current Application to amalgamate FEI's propane supply portfolio costs with its natural gas supply portfolio costs is an innovative, least cost, non-capital solution to address the issue that the commodity prices for

Revelstoke propane have historically been more volatile and higher than natural gas prices on an energy equivalent basis.

Further, FEI believes that the concept of postage stamp rates for the same type of service (the provision of gas) and of not differentiating rates on the basis of location has now been well established, and that it is now appropriate for the BCUC to consider whether FEI's proposal should be approved in consideration of provincial energy policy along with established rate design principles.

9.3 What factors precluded FEI from amalgamating Revelstoke's propane cost with the MCRA previously? Please elaborate.

Response:

Please refer to the response to BCUC IR 1.9.2.1. FEI is bringing forward this Application now because the other alternatives have been explored and rejected.

9.4 Does FEI's amalgamation proposal result in FEI's Mainland and Vancouver Island service customers cross subsidizing customers within the same rate class? Please discuss.

Response:

FEI confirms that its proposed rate setting mechanism does represent a cross-subsidy within the same class of service.

To some extent, all customers, even those with the same fuel type, have a different cost of service resulting from their geographical location. For example, FEI's Cranbrook natural gas customers pay the same commodity, and storage and transport recovery rates as FEI's Vancouver natural gas customers even though two geographically motivated differences distinguish them from each other:

1. Cranbrook customers are likely receiving methane molecules from AECO that were purchased at a different commodity price than methane molecules from Station 2.

2. Transportation and storage costs related to the methane molecules purchased at AECO differ from the transportation and storage costs related to the methane molecules purchased at Station 2.

9.5 Please discuss the advantages and disadvantages of having postage stamp rates that include two different commodities.

Response:

The following table summarizes the advantages and disadvantages of FEI's proposal both with reference to Bonbright Principles and to Benefits and Costs

Attribute	Advantages	Disadvantages
With reference to Bonbright Principles (See FEI's responses to BCUC IR 1.9.6)		
Fair Apportionment of Costs	It reflects the shared cost of providing energy service, notwithstanding fuel-type. The fuel-type is the result of historical decisions that can place a location at a disadvantage for the preferred energy type.	Does not reflect the cost of the type of fuel being consumed at a location.
Price signals that encourage efficient use	Although FEI's experience is small volume customers such as residential and commercial customers are generally price inelastic, the lower postage stamp rate provides an added economic incentive for fuel oil consumers to convert to propane resulting in lower GHG emissions in Revelstoke.	May provide a price incentive for current customers consuming propane to increase consumption, although again residential and commercial customers have been found to be generally price inelastic.
Customer Understanding and Acceptance	No change in customer understanding, but improved acceptance on the systematic fair allocation of the service of providing energy costs for heating and electricity.	
Rate stability	Significant improvement for customers in Revelstoke.	N/A. Due to the relative significantly smaller size of the propane load to the natural gas load, it will have a negligible effect on the rates paid by FEI customers that receive natural gas.

Attribute	Advantages	Disadvantages
With reference to Benefits & Costs (See FEI's responses to BCUC IR 1.3.1)		
Bill Impact	Net decrease of annual bill by $407 for Residential customer using 50 GJ per year.	FEI Residential customer using 90 GJ per year would have an annual increase of $0.98.
GHG reduction in Revelstoke	Incent customers to convert from fuel oil to propane.	
Economic Development; and creation and retention of jobs (See FEI's response to BCUC IR 1.2.10)	Encourage economic development and support creation and retention of jobs.	

The BCUC has to weigh conflicting rate design objectives to arrive at a decision that is in the public interest, not necessarily in the interest of any particular party. The primary rate design principles that are in question are the principles of the fair apportionment of costs and rate stability (customer acceptance in this case is tied to the variability of rates experienced by Revelstoke customers). FEI believes that, since the differentiated cost is sufficiently small the BCUC should place more weight on simplifying the tariff for ease of understanding and acceptance, addressing a perceived unfairness of differentiated rates for the service of receiving energy measured in GJ – i.e., to have the same price for energy service notwithstanding the location in the FEI service territory or the particular fuel type. This would be consistent with the Ministry of Energy and Mines policy as expressed in the FEU Common Rates, Amalgamation Rate Design Reconsideration Phase 2, Exhibit C3-1:

> The Ministry supports reconsideration of Order No. G-26-13, as noted in the April 15, 2013 letter from the Ministry to FortisBC supporting their request for reconsideration submitted on April 26, 2013. In the letter the Ministry notes the following:
>
> > From a public policy perspective, the Ministry is of the opinion that a common rate resulting from the proposed amalgamation of FortisBC Energy Utilities will have benefits for all FortisBC Energy customers in British Columbia.
> >
> > Government policy has been to promote access to energy services on a postage stamp rate basis so that all British Columbians benefit from access to services at the lowest average cost. (Page 1)

The postage-stamp rate from amalgamating propane and natural gas commodity costs is consistent with the Ministry's position that it was desirable for all 'British Columbians to access services at the lowest average cost'.

Please also refer to the response to BCUC IR 1.9.6 and BCUC IR 1.3.1.

9.6 Please explain how the cost causation principle is maintained when the proposed amalgamation includes two distinct fuel types.

Response:

If cost causation is considered for the allocation of total energy costs to customers for the energy they consume and not the type of fuel, then cost causation is maintained and the recovery is accomplished by postage-stamp rates.

Had different historical decisions regarding upstream pipeline routes been made regarding their location and capacity, it is conceivable a different fuel type such as natural gas with a lower cost may have been economic for Revelstoke. The fuel type for Revelstoke is a product of history, but is consistent with FEI's approach for energy resources to acquire them with the overall intent of achieving the least cost for all customers.

Notwithstanding the fuel type consumed, FEI's cost of service related to its transmission and distribution system along with the cost of service for the propane plant and distribution system in Revelstoke has never been separated, and all of FEI's customers, regardless of fuel type consumed, pay a postage-stamp delivery charge. There is no reason why this principle could not be extended to the commodity rate.

Finally, the fair apportionment of costs among customers is only one of the principles in rate design and needs to be balanced with other rate design principles. FEI has provided an analysis of Bonbright principles in the following table. The principles listed are those that were included in FEI's 2016 Rate Design Application[7]. The first column lists the principles, the second column provides a description of the principle and the last column provides FEI's comments on the relative importance and how the principle applies to this Application – 'Revelstoke Propane Portfolio Cost Amalgamation'.

[7] FortisBC Energy Inc. 2016 Rate Design Application, Section 5.3 Rate Design Principles, pg. 5-2; Commission Decision and Order G-45-11 in the BC Hydro Residential Inclining Block Re-Pricing Application; Exhibit A2-2 FEI Revelstoke Propane Portfolio Cost Amalgamation, FEU Response to BCUC IR 1, Pg. 30 reference to James C. Bonbright, Principles of Public Utility Rates, Columbia University Press, 1961. See also Bonbright, James C., Danielsen, Albert L., and Kamerschen, David R., Principles of Public Utility Rates, 2nd Ed., Public Utility Reports, Inc., 1988, pp. 382 – 384 discussion on 'Attributes of a Sound Rate Structure'.

Principle	Description	Importance to Propane Cost Amalgamation Application
Principle 1: Recovering the Cost of Service	The aggregate of all customer rates and revenues must be sufficient to recover the utility's total cost of service.	Low: Continued use of deferral accounts ensures continuation of recovery of the commodity costs of propane and natural gas, as well as the midstream costs, will maintain recovery of FEI's cost of service irrespective of the whether FEI's proposal is accepted.
Principle 2: Fair apportionment of costs among customers	Appropriate cost recovery should be reflected in rates.	High: The issue of the fair apportionment of commodity and midstream costs for the same service between customers in Revelstoke and all other FEI customers is a primary consideration in FEI's proposal. It is a question of fact that the BCUC must decide if the proposed amalgamation would be unduly discriminatory.
Principle 3: Price signals that encourage efficient use	Appropriate price levels and structures that encourage efficient use and as a corollary discourage inefficient use.	Mixed: Theoretically, there could be a trade-off of lower postage stamp commodity / midstream rates resulting in higher consumption for current propane customers versus the lower prices attracting potential customers to fuel switch from heating oil resulting in lower GHG emissions. However, FEI's experience is there is very little movement of demand from changes in price for propane (See FEI's response to BCUC IR 1.6.1). Consequently, FEI would expect that overall GHG emissions would decline from any conversions from heating oil to propane. In addition to the price of energy from FEI, potential customers for conversion to propane will also factor in their own costs as well and how long it would take for energy savings to offset the customer's cost of conversion (See FEI's response to BCUC IR 1.7.3.1).
Principle 4: Customer Understanding and Acceptance	"The related, practical attributes of simplicity, certainty, convenience of payment, economy in collection, understandability, public acceptability, and feasibility of application. Freedom from controversies as to proper interpretation"[8].	High: As a result of the Inquiry Report and associated letters of comment[9] it is clear that Revelstoke customers understand that they are postage stamped when it comes to electric rates yet not postage stamped when it comes to gas rates. With this understanding, Revelstoke customers felt that this was inequitable considering how close they

[8] Bonbright, James C., Danielsen, Albert L., and Kamerschen, David R., Principles of Public Utility Rates, 2nd ed.,

Principle	Description	Importance to Propane Cost Amalgamation Application
		were to BC Hydro dams and electric generation which would, if not postage stamped, result is less costly electricity to them.
Principle 5: Practical and cost-effective to implement	Sustainable and meet long-term objectives.	Low: Whether rates are postage-stamped or differentiated based on fuel type (propane or natural gas) there are negligible issues with cost effectiveness to implement.
Principle 6: Rate Stability	Customer rate impact should be predictable and managed.	High: For Revelstoke customers the proposal would increase rate stability. For all other FEI customers it would have a negligible impact on rates.
Principle 7: Revenue Stability	Utility revenues / customer cost should be predictable and stable.	Low: Revenue stability is not an issue as FEI's revenue would be unaffected by the approval of the proposal..
Principle 8: Avoidance of undue discrimination	Interclass equity must be enhanced and maintained	Mixed: It is a question of fact that the BCUC must decide whether the changes being applied for, now, by FEI would result in undue discrimination and would be unduly preferential. It is FEI's position that the changes requested are not unduly discriminatory or unduly preferential but significantly enhance revenue and energy cost stability for customers in Revelstoke without a compromising on the fair allocation of the provision of energy service.

It is also relevant to be mindful of what FEI stated after identifying the eight principles above:

> FEI does not apply the eight principles above in any priority or with any particular weighting. Rate design is a complex balancing process as it frequently requires the application of multiple, and sometimes conflicting, principles and the consideration of viewpoints from various stakeholders. In addition, different rate design principles may have varying levels of importance in different contexts. FEI therefore applies its experience and judgment to consider and balance the most relevant principles in a given context when identifying rate design issues and proposing rate design solutions. Rate design should strive to strike a balance

Public Utility Reports, Inc., 1988, pg. 384.

[9] BCUC Order No. G-100-96, dated October 10, 1996, Appendix 1 – Inquiry Report, pp. 13 - 14. See also in this proceeding Letters of Comment, Exhibits E-1 and E-3,

among competing rate design principles based on specific characteristics of customers in each rate schedule.[10]

In the 1996 Inquiry Report on 'Propane Price Increases in the City of Revelstoke' the BCUC wrote the following for why it recommended to increase the propane rates and not roll in the commodity costs of propane and natural gas[11].

> Rolling in the cost of propane with the cost of natural gas introduces added complexity. At the Inquiry, Commission staff indicated some of the problems a rolled-in price would create. There are similar isolated areas dependent on piped propane such as Whistler and Port Alice in the Centra Gas service area. On Vancouver Island all natural gas customers pay even higher prices than in Revelstoke as rate are set at home heating oil equivalents until the high costs of extending the natural gas pipeline are recovered. Consideration may also have to be given to isolated areas paying higher prices for diesel generated electricity. It would require time to examine the impacts and alternatives and would require input from other customers affected.

Since 1996, Centra Gas sold the Port Alice propane operation, Whistler was converted to natural gas, Vancouver Island customer rates have ceased to be set based on heating oil or BC Hydro electric equivalent rates. In fact, Vancouver Island and Whistler customers have had their delivery costs / rates, commodity and midstream rates amalgamated with FEI Mainland. The Inquiry Report anticipated at some future time a different approach to handling Revelstoke commodity costs would be appropriate. The final paragraph of the Inquiry Report reads[12]:

> BC Gas [now FEI] should be directed to work innovatively, diligently and cooperatively with the Utilities Commission and appropriate ministries of the government to seek methods of leveling out the impact on customer rates of volatile pricing in energy supply markets. Longer term contracts, rolled-in costs, or a broader customer base are all options to be examined. The public expects actions by utilities, regulation by the Commission and provincial government policy to ensure, wherever possible, access by the public to stable, long-term competitive and affordable energy resources.

FEI believes that it is now appropriate to fully amalgamate the propane and natural gas costs to create postage stamp rates in order to enhance rate and customer energy cost stability as contemplated by the BCUC Inquiry Report.

[10] FortisBC Energy Inc. 2016 Rate Design Application, Section 5.3 Rate Design Principles, pp. 5-2 – 5-3.
[11] BCUC Order No. G-100-96, dated October 10, 1996, Appendix 1 – Inquiry Report, pg. 18.
[12] BCUC Order No. G-100-96, dated October 10, 1996, Appendix 1 – Inquiry Report, pg. 19.

9.7 Please discuss if FEI is aware of any other jurisdictions where two different gas types, with distinct supply, demand, pricing and volatility dynamics, have been amalgamated into the same gas cost recovery rate.

Response:

FEI is not aware of this situation currently occurring.

However, FEI, has been made aware that Washington Natural Gas (prior to the merger with Puget Power) had provided a non-tariffed propane service to customers in anticipation of connecting these customers to the distribution system at a later date. The customers receiving propane were charged the regular residential tariff rate which included the average cost of gas for all fuel types. This is no longer the practice in Washington State. Currently, there is a separate cost-based tariff for customers whose fuel type consumption is propane.

Additionally in 2009, FEI's predecessor entity in Whistler charged a single blended gas cost recovery rate to its customers as this service area was transitioning from propane to natural gas. During this time, Whistler customers had both propane and natural gas costs, how much of each fuel type was dependent on the timing of their conversion from propane to natural gas. The applicable blended gas cost recovery rate was approved by the BCUC in order G-35-09.

9.7.1 Please provide any relevant jurisdictional analysis.

Response:

Please refer to the response to BCUC IR 1.9.7.

10.0 Reference: COMMODITY RATE SETTING

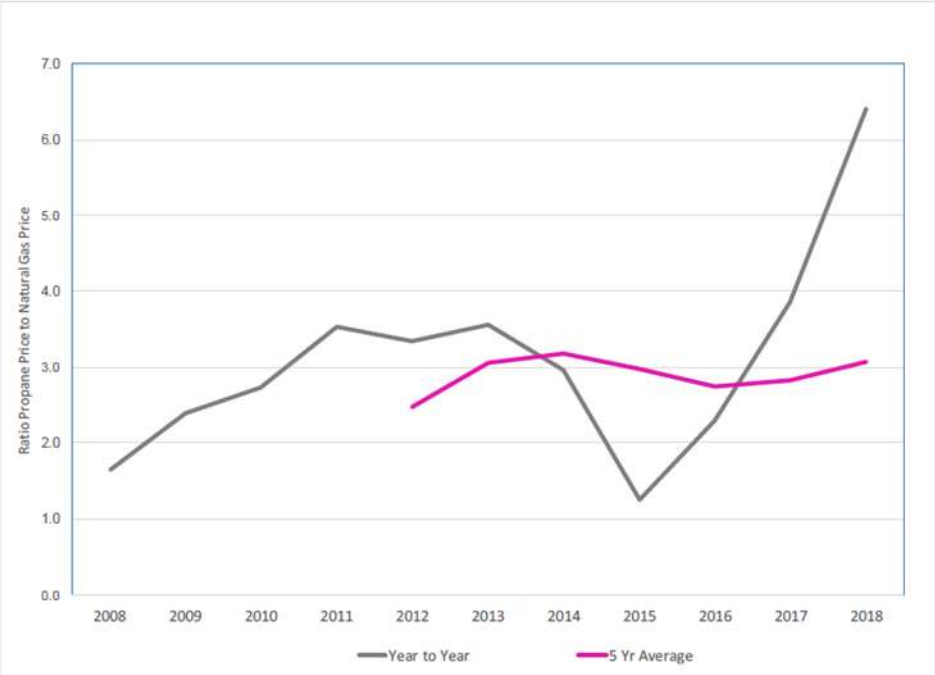
Exhibit B-1, pp. 10–11; Exhibit A2-1, 2019-2020 Annual Contracting Plan – Executive Summary, 2019-20 ACP), Attachment, pp. E-4–E-5

Option 2 – Five-Year Rolling Price Difference

Page 10 of the Application states:

> FEI proposes to set the propane gas cost recovery rate with a premium multiplier based on the five-year rolling average of annual propane to natural gas price ratios (AECO natural gas prices and Alberta Propane prices). As an example, Figure 3-1 below shows the five-year rolling average of annual propane to natural gas price ratios from 2012 to 2018, with a comparison of the annual propane to natural gas price ratio. The 2018 five-year rolling average of the ratio is 3.064. It can be seen from Figure 3-1 that the five-year rolling average of the price ratios remains relatively flat. If the propane gas cost recovery rate is set based on the five-year rolling average of the price ratios as an index multiplier the resulting propane cost recovery rate will mitigate the rate volatility for Revelstoke propane customers.

Figure 3-1: Comparison of Propane to Natural Gas Price Ratio



10.1 Please provide the monthly AECO natural gas and Alberta propane prices over the past five years in Excel format. As part of your response, please provide the level of correlation between the two prices.

Response:

Please refer to the Excel file provided in Attachment 10.1 for the monthly AECO natural gas and Alberta propane prices from 2014 to 2018. The correlation between the two prices is at 0.36.

10.2 Please discuss the use of a five-year rolling average of annual propane and natural gas prices to determine the premium multiplier versus the use of a of five-year rolling average of monthly propane and natural gas prices to determine the premium multiplier. In your response, please discuss the advantages and disadvantages of each method.

Response:

Figure 3-1 uses the annualized monthly average propane and natural gas prices to determine the ratio of the two prices. FEI used the premium multiplier because it is less volatile with the five-year rolling average compared to the year-to-year ratio.

Pages E-4 and E-5 of Exhibit A2-1 identifies the gas procurement and pricing strategy which includes the following statements:

- FEI recommends continuing with a balanced mix of daily and monthly priced commodity supply in the portfolio to provide operational flexibility and to help mitigate adverse price movements.
- The baseload supply receipt point allocation is to remain at the same levels as last year, which is 75 percent at Station 2 and 25 percent at AECO/NIT.

10.3 Please explain whether the procurement of propane supply to meet Revelstoke service area requirements is considered part of FEI's baseload supply requirements.

Response:

Revelstoke propane supply requirements are not considered part of FEI's baseload supply requirements under the Essential Services Model.

10.4 Please compare the monthly Station 2 natural gas price against the Alberta propane price over the past five years, in Excel format. As part of your response, please discuss the level of correlation between the two prices.

Response:

Please refer to Excel file provided in Attachment 10.4 for the monthly Station 2 natural gas price to the Alberta propane price comparison from 2014 to 2018. The correlation between the two prices is at 0.45.

10.5 Please discuss why the premium multiplier is based only on AECO natural gas prices rather than a weighted natural gas price based on 75%/25% split of Station 2 and AECO prices.

Response:

The Alberta propane prices, which correlate with where FEI procures its supply for Revelstoke, were compared to the AECO natural gas prices to provide energy price comparatives without including the impact of regional price dynamics that occur between AECO and Station 2.

11.0 Reference: RATE IMPACT

Exhibit B-1, Section 3.1, pp. 7–8; Appendix D

Propane Cost Deferral Account

On pages 7–8 of the Application, FEI states:

> The cost of the propane supply portfolio is currently captured in the Propane Cost Deferral Account (PCDA) and is accounted for separately from FEI's natural gas supply portfolio cost. With this Application, FEI proposes to:
>
> 1. Amalgamate its Revelstoke propane supply portfolio costs with its natural gas supply portfolio costs by transferring the December 31, 2019 closing balance of the PCDA to FEI's existing MCRA as an opening balance adjustment, effective January 1, 2020;
> 2. Starting January 1, 2020, capture all Revelstoke propane supply portfolio costs in the MCRA; and
> 3. Eliminate the PCDA.
>
> The reason that FEI proposes to capture the Revelstoke propane supply portfolio costs in the existing MCRA is because the profile of the Revelstoke propane supply varies with weather. As such, FEI's Revelstoke propane purchases are shaped to the relative level of seasonal consumption, similar to how FEI currently captures costs for seasonally shaping its natural gas supply in the existing MCRA.

Appendix D shows the impact of the proposed rate amalgamation on customers who pay the RS1, RS2, RS3, RS4 and RS5 rates.

11.1 Please explain the advantages and disadvantages of continuing to amortize the PCDA to the Commodity Cost Reconciliation Account, similar to how natural gas purchases are amortized. As part of your response, please compare this to the advantages and disadvantages of amortizing the PCDA to the MCRA.

Response:

FEI did not consider using the CCRA to capture the closing balance of the PCDA after the elimination of PCDA as proposed, and/or to capture the Revelstoke propane supply costs portfolio as well as any associated forecast variance. The primary reason for this is that, under the Essential Services Model currently in place to support the Customer Choice Program, the CCRA mechanism has been designed to only deal with the baseload requirements of FEI's natural gas customers who choose to remain on the standard commodity sales rate offering. Given that the Revelstoke propane supply portfolio has not been disaggregated between baseload and non-baseload supply, its costs and variances are more appropriately captured

and managed via the MCRA. For the reasons identified above, FEI has not developed a methodology that would allow it to model capturing and amortizing the PCDA closing balance, and the Revelstoke propane supply portfolio costs and any associated forecast variances, via the CCRA.

FEI clarifies that the Revelstoke Propane Cost Deferral Account (PCDA) is not currently amortized to either the Commodity Cost Reconciliation Account (CCRA) or the Midstream Cost Reconciliation Account (MCRA). In the Application, FEI is proposing to close the PCDA and transfer the closing balance to the MCRA, and to use the MCRA to capture the Revelstoke propane supply portfolio costs and variances after the PCDA is closed.

11.2 Please provide updated tables in Appendix D to compare the effect of continuing to amortize the PCDA in the Commodity Cost Reconciliation Account, instead of through the MCRA.

Response:

Please refer to the response to BCUC IR 1.11.1.

12.0 Reference: RATE IMPACT

Exhibit B-1, Section 3.2, p. 8; Section 3.4, p. 14

Options and Impact on alternative fuel sources

On page 8 of the Application, FEI states: "FEI considered two options for calculating the propane gas cost recovery rates for Revelstoke customers: 1) equal gas cost recovery and 2) a five-year rolling average of the price difference between propane and natural gas."

Page 14 of the Application states:

> [N]either of the options preclude future review of potential options to upgrade the Revelstoke propane system to natural gas, which may include consideration of alternatives such as a natural gas pipeline, liquefied natural gas (LNG) supply, or compressed natural gas (CNG) supply in consideration of both the economic and non-financial benefits at the time."

12.1 Please comment on how a single rate that represents more than one type of gas product (in this case, natural gas and propane), would affect the rates that FEI charges customers under its Tariff for other fuel sources, such as LNG.

Response:

FEI does not consider LNG to be a different fuel source; if LNG commodity is provided to customers it is charged using a standard rate schedule. The LNG rate schedule (Rate Schedule 46) is only for the dispensing and transportation of LNG.

Transportation Service customers (Rate Schedules 23, 25, 26, 27, 22, 22A and 22B) would not be affected by FEI's proposal because they do not pay the midstream rate. Please refer to the table below for the incremental rate impact on the Storage and Transport (Midstream) Charge for Rate Schedule 1 through Rate Schedule 7 (sales customers) and Rate Schedule 46 (LNG) based on proposed Option 1:

Rate Schedule	Service	Incremental Rate Impact $ / GJ
1	Residential	$0.011
2	Small Commercial	$0.012
3	Large Commercial	$0.009
4	Seasonal	$0.008
5	General Firm	$0.008
6	Natural Gas Vehicle	$0.004
7	General Interruptible	$0.008

Rate Schedule	Service	Incremental Rate Impact $ / GJ
46	Liquefied Natural Gas Sales, Dispensing and Transportation	$0.008

12.2 Please discuss FEI's view as to whether the provision of propane and the provision of natural gas are two distinct services.

Response:

Propane and natural gas are distinct fuel types, however, the service for all customers is the delivery and sale of energy in the most cost efficient manner possible. The service is not dependent on the type of fuel, but the commodity and midstream costs are currently dependent on the type of fuel, which is the issue that FEI is addressing with this Application.

12.3 Please discuss whether FEI considered any alternative options for calculating the propane gas recovery rates for Revelstoke.

Response:

FEI also investigated possible mechanisms to calculate propane recovery rates for Revelstoke based on the ratio of carbon pricing between propane and natural gas. However, FEI did not fully explore this option as the province is responsible for setting the carbon tax in a way that reflects the carbon intensity of various fuel types.

FEI focused on Option 1 as presented in the Application for the objectives of addressing rate volatility of propane costs and rate disparity between Revelstoke's propane and FEI's natural gas customers. Option 2 was included in the Application to demonstrate the range of alternatives FEI considered between fully amalgamated rates which are set to recover the cost of the blended portfolio (Option 1) and amalgamated rates that are set to recover the cost of propane over time (Option 2). As discussed in Section 3 of the Application, Option 2 (5-Year Rolling Average-Indexed Propane Cost Recovery) only addresses the rate volatility objective. Ultimately, Option 1 is the preferred option as it can address both objectives with small impact to all FEI customers.

12.3.1 If yes, please provide a table comparing alternative options including an explanation of why these options were rejected.

Response:

Please refer to the response to BCUC IR 1.12.3.

12.3.2 If not, please explain why these two options were the only ones explored.

Response:

Please refer to the response to BCUC IR 1.12.3.

12.4 Please discuss, providing supporting data where possible, the factors that FEI would consider when assessing the viability of connecting Revelstoke to the natural gas distribution system.

Response:

FEI will continue to investigate potential options to connect Revelstoke to FEI's natural gas distribution system, and will pursue such a project if FEI considers it is economically feasible and supported by BC's energy objectives.

12.5 Please discuss how the proposed amalgamation will smooth the volatility of seasonal price variations. As part of your response, please address the impact of reduced seasonal price volatility on the ability of customers to respond to such price movements.

Response:

As discussed in the response to BCUC IR 1.8.6, the current rate setting mechanisms for propane, as well as natural gas, are based on the 12-month prospective forward prices which remove seasonal variations in the gas costs utilized in the quarterly review and, if warranted, resetting of gas costs recovery rates.

The proposed amalgamation of the propane and natural gas portfolio costs and implementation of Option 1 for rate setting would provide Revelstoke customers rates matching those of FEI's natural gas customers, and rate changes would reflect the same levels of frequency and magnitude. There would be no anticipated change with respect to how the current rate setting models smooth seasonal price variations.

13.0 Reference: COMMODITY RATE SETTING

Exhibit B-1, Section 2.2, pp. 5–6; Section 3.2.1, p. 9; Section 3.4, p. 14

BC's Clean Energy Objectives & Carbon Tax

On pages 5–6 of the Application FEI states:

[T]he proposed changes support the following two of BC's energy objectives under section 2 of the *Clean Energy Act*:

(h) to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia; and

(k) to encourage economic development and the creation and retention of jobs.

Page 9 of the Application states:

> Under this equal commodity cost recovery option, FEI's Revelstoke propane and FEI's natural gas customers will pay the same commodity related charges per GJ, but alignment with BC's energy objectives is preserved as propane customers will continue to pay higher carbon tax rates than natural gas customers.

Page 14 of the Application states:

> [N]either of the options preclude future review of potential options to upgrade the Revelstoke propane system to natural gas, which may include consideration of alternatives such as a natural gas pipeline, liquefied natural gas (LNG) supply, or compressed natural gas (CNG) supply.

13.1 Please discuss FEI's view on how long propane will remain the primary fuel type in Revelstoke.

Response:

FEI cannot predict how long propane will remain the primary fuel type in Revelstoke as there are many factors such as costs, technological advancements, government and environmental policy, economical activities in Revelstoke, individual preferences of different fuel types, etc. which could accelerate or delay the conversion from propane to natural gas, electricity, biomass, or other fuel types. Please also refer to the response to BCUC IR 1.12.4.

13.2 Did FEI explore the natural gas, LNG or CNG options for Revelstoke at this time? Please discuss.

Response:

FEI did not explore natural gas, LNG, or CNG options for Revelstoke as part of this Application. As discussed in BCUC IR 1.9.2.1, FEI investigated connecting Revelstoke with natural gas in 2015 and 2016 but the project was considered not economically feasible. FEI has since investigated other mechanisms to address the high commodity volatility and high commodity price of propane for Revelstoke which led to the current Application. Please also refer to BCUC IR 1.8.3 for high-level cost estimates from 2015 for a physical pipeline and a virtual LNG pipeline to Revelstoke.

13.2.1 If so, please provide any cost/benefit analysis FEI has performed for each of the alterative options.

Response:

Please refer to the response to BCUC IR 1.13.2.

13.2.2 If not, why were these options not explored at this time?

Response:

Please refer to the response to BCUC IR 1.13.2.

13.3 Please provide a table comparing the effective rate per GJ, inclusive of the Carbon Tax, for FEI's natural gas customers, Revelstoke customers, and Revelstoke customers under FEI's amalgamation proposal.

Response:

Please see the table below for the requested comparison:

	Current Separate Commodity Portfolio		Proposed Amalgamation	
$/GJ, Forecast January 1, 2020	FEI	Revelstoke	FEI	Revelstoke
Cost of Gas	1.549	1.549	1.549	1.549
Storage and Transport, Effective	1.082	1.082	1.093	1.093
Rate Rider 6 - MCRA, Effective	0.101	-	0.100	0.100
Rider 1 Propane Surcharge	-	7.604	-	-
Commodity Related Charges[1]	2.732	10.235	2.742	2.742
Delivery Margin Related Charges[2]	4.039	4.039	4.039	4.039
Total Effective Rate	6.771	14.274	6.781	6.781
Carbon Tax (April 2019 to March 2020)	1.986	2.407	1.986	2.407
Total Effective Rate, incl. Carbon Tax	8.757	16.681	8.767	9.188

1 - Appendix A-1, Line 41 to 59, Column 2

2 - 2019 Approved, BCUC Order G-30-19

13.4 Please confirm, or explain otherwise, that the propane cost savings per GJ for Revelstoke propane customers as a result of the proposed amalgamation is greater than the difference between the higher carbon tax rate paid by Revelstoke propane customers compared with FEI's natural gas customers.

Response:

Confirmed.

13.4.1 If confirmed, please discuss the efficacy of the carbon tax rate for Revelstoke propane customers.

Response:

For clarity, Revelstoke propane customers will continue to pay for the higher carbon tax rate of propane compared to FEI's natural gas customers. Therefore, FEI does not believe the proposed amalgamation undermines the efficacy of the carbon tax.

FEI notes that the province currently sets the carbon tax rate by the GHG emission intensity of the fuel, not by the price of the commodity. The price of the commodity could vary on any given day, but the carbon tax rate remains the same, except when the province increases or

decreases the rate through various government policies. For example, the retail prices of diesel for vehicles, before any taxes, are on average lower than the retail price of gasoline for vehicles[13], however, diesel has a higher GHG emission intensity[14] as a fuel and therefore, a higher carbon tax rate[15] than gasoline.

13.5 Please explain how the proposed lower propane rates provide the correct price signal for energy conservation.

Response:

FEI believes the proposed amalgamation does not change the price signal for energy conservation to propane customers in Revelstoke. The revenues recovered from Revelstoke's propane customers will continue to be predominantly based on variable rates with a small portion recovered via the fixed basic charge. Therefore, although lower and less volatile, the rate structure continues to promote energy conservation to Revelstoke's propane customers where high energy users will continue to pay more than low energy users. FEI's energy conservation programs continue to be available to Revelstoke customers to encourage energy conservation. Furthermore, as discussed in the response to BCUC IR 1.13.4.1, Revelstoke propane customers will continue to pay higher carbon tax rates which are variable with the volume of energy consumed. Accordingly, the price signal to high energy consumers will remain unchanged with FEI's proposed amalgamation.

13.6 Please discuss how lower rates may result in the increased usage of propane and how increased demand may detrimentally affect the net CO2 emissions savings.

Response:

As discussed in the response to BCUC IR 1.13.4.1, the BC government currently sets carbon tax rates based on GHG emission intensities. Therefore, carbon tax rates are unaffected by the

[13] NRCan monthly average retail price of gasoline: http://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=1&locationID=66&locationID=2&frequency=M&priceYear=2019&Redisplay=
NRCan monthly average retail price of diesel: http://www2.nrcan.gc.ca/eneene/sources/pripri/prices_bycity_e.cfm?productID=5&locationID=66&locationID=2&frequency=M&priceYear=2019&Redisplay=

[14] https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/methodology/2018-pso-methodology.pdf

[15] https://www2.gov.bc.ca/assets/gov/taxes/sales-taxes/publications/mft-ct-005-tax-rates-fuels.pdf

price of the commodity or by the relative differences in commodity prices between multiple fuel types. After the proposed amalgamation, FEI's Revelstoke propane customers will continue to pay for the applicable higher carbon tax rate for propane and not the carbon tax rate applicable to natural gas. This means that Revelstoke propane customers with high energy use will continue to pay more carbon tax than low-use customers. As such, the GHG-related price signal that Revelstoke customers face will remain unchanged and will continue to support BC's energy objectives.

FEI notes that BC's energy objectives focus on multiple measures that include economic development, the development of rural and indigenous communities, GHG emissions reduction, support for clean and renewable energy and innovative energy technologies, and energy conservation. The amalgamation proposed in this Application mitigates Revelstoke propane customer rate volatility and continues to support BC's energy objectives as discussed in Section 2.2 of the Application:

- To encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia. Please refer to FEI's response to BCUC IR 1.2.7.2; and
- To encourage economic development and the creation and retention of jobs. Please refer to FEI's response to BCUC IR 1.2.10.

Increased use of propane in Revelstoke could occur for two primary reasons if the Application is approved. First, customers that already use propane may increase their existing propane consumption rate. FEI has not examined the price elasticity of its Revelstoke propane customers and thus is not certain how much approval of the Application could cause customers to increase their existing propane demand. However, as demonstrated in the response to BCUC IR 1.6.1, there is no or low correlation between propane rates and demand in Revelstoke historically, even when the propane rates were at a similarly low level as the ones proposed in this Application. FEI cannot predict if existing propane customers might increase or decrease the usage of propane after the approval of the Application as this also depends on the individual conservation behavior of the existing customers and on other potential government policies. Existing propane customers may simply elect to invest the savings from reduced energy rates into other economic activities. As explained in the response to BCUC IR 1.2.10, such investment may support economic development and the creation and retention of jobs in Revelstoke.

Second, customers may convert to propane from other fuel types. If the incumbent fuel types for this conversion have a higher GHG-intensity than propane, such conversions will result in overall GHG abatement. As noted in the response to BCUC IR 1.2.7.2, converting all Revelstoke residential customer heating oil use to propane could potentially save approximately 100 metric tonnes of CO_2e emissions per year. Economic development can be contingent on and also result in increased total energy demand. As such, an increased demand forecast for

propane within the context of the Application does not automatically preclude growth of clean and renewable energy sources in Revelstoke.

13.6.1 The proposed amalgamation impact reduces the propane commodity rate by approximately $6/GJ and the difference between the Carbon Tax is approximately $0.50/GJ. Considering those price differentials, please explain how the proposed amalgamation impacts BC's energy objectives.

Response:

Please refer to the response to BCUC IR 1.13.6.

13.7 Please explain how the potential for an increased demand forecast for propane in Revelstoke meets the clean energy objectives compared to other energy sources, such as biomass, available in Revelstoke.

Response:

Please refer to the response to BCUC IR 1.13.6.

D. LOAD GROWTH

14.0 Reference: LOAD GROWTH

Exhibit B-1, pp. 15, 18; FortisBC Energy Inc. and FortisBC Inc. (collectively FortisBC) Multi-Year Rate Plan Application for 2020 to 2024 (MRP Application) proceeding, Exhibit B-1, pp. C-56, C-64-C-65

Growth Capital vs. Sustainment Capital

Page 15 of the Application states:

> Another benefit of the rate stability and rate relief offered to Revelstoke customers by the proposed amalgamation of FEI's propane supply costs into the natural gas supply costs would be accelerated load growth in Revelstoke with conversions from other fuel types (e.g., from heating oil to propane, which would provide associated GHG emissions benefits). This potential load growth could also lead to accelerated capital upgrade requirements for the Revelstoke distribution system.

Page 18 of the Application states: "the total capital cost of the upgrade is estimated to be $2.798 million in 2019 dollars."

On page C-56 of the MRP Application states the following:

- FEI's Growth capital expenditures are necessary to attach new customers to the gas distribution system. These expenditures include the installation of new mains, services, meters and distribution system improvements to serve new customers. The primary driver for Growth capital expenditures is gross customer additions, which is the number of new customers attaching to the gas distribution system with new mains and/or service installations and includes all customer segments.
- Distribution system improvement costs have historically been included in Sustainment capital, but the driver for these costs is more closely tied to customer additions.

Page C-64 states: "The expenditures within Sustainment capital include gas system improvements to the transmission and distribution system in order to meet forecast load and to ensure the safety, reliability and integrity of the system."

Table C3-7 on page C-65 summarizes Sustainment and Other capital expenditures required over the 2020-2024 period:

Table C3-7: FEI Sustainment Capital Expenditures 2020-2024 ($000s)

	Average 2017-2019P	2020	2021	2022	2023	2024
Customer Measurement	31,864	30,559	31,328	31,781	32,461	32,979
Transmission System Reliability & Integrity	39,663	42,213	37,599	41,021	45,792	47,355
Distribution System Reliability	16,336	14,996	11,949	19,235	12,541	21,890
Distribution System Integrity	22,946	24,219	31,615	25,080	28,924	22,168
Sustainment CIAC	(4,013)	(3,902)	(3,902)	(3,902)	(3,902)	(3,902)
Sustainment Capital – Total	106,796	108,085	108,589	113,215	115,815	120,490

14.1 Please discuss whether capital upgrades to the Revelstoke distribution system would be categorized a growth capital expenditure or a sustainment capital expenditure.

Response:

FEI would categorize these expenditures as growth capital expenditures, particularly growth capital system improvements, as the upgrades of both the storage tank additions and the distribution main upgrades are triggered as a result of projected larger numbers of new conversion customer service/meter attachments.

14.1.1 If the capital upgrades are considered to be a growth capital expenditure, please explain whether the growth capital formula was applied in deriving the estimated $2.798 million cost of upgrade.

Response:

FEI did not use the growth capital formula to derive the estimate of $2.798 million. A growth capital formula is used to set the growth capital envelope (the growth capital recovered in rates) each year whereas the estimated costs of the Revelstoke upgrades are based on the specific requirements to meet system demand in Revelstoke.

14.2 If the capital upgrades are considered to be sustainment capital, please confirm, or otherwise explain, whether the estimated $2.798 million cost of upgrade is included in Table C3-7 as provided in the preamble.

1 **Response:**

2 Please refer to the response to BCUC IR 1.14.1.

Attachment 1.1

REFER TO LIVE SPREADSHEET MODEL

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)

Attachment 10.1

REFER TO LIVE SPREADSHEET MODEL

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Attachment 10.4

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